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CLOSED INTRAPLEURAL PNEUMOLYSIS

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Artificial pneumothorax has been established for a number of years as a therapeutic measure in pulmonary tuberculosis. While there have been many successful results, there have also been many failures, associated for the most part with adhesions preventing the complete collapse of the diseased area of the lung. The operation of internal pneumolysis was devised by Jacobaeus to deal with adhesions of this character.

Between February, 1936, and December, 1937, 235 patients were operated on by one of us (P. W. E.): 260 operations were done on 255 pneumothoraces. The number of pneumothoraces exceeds the number of patients because in twenty patients with bilateral pneumothorax the operation was carried out on both sides. In five cases only was the operation done in two stages, though in four others a second stage was contemplated but not carried out, as thoracoscopy at a later stage showed that the remaining adhesions were completely inoperable.

TABLE I.—*Internal Pneumolysis, February, 1936, to December, 1937*

No. of patients	235	No. of operations, 260:	
No. of pneumothoraces, 255:		One-stage unilateral	210
(1) Unilateral	215	One-stage bilateral (20 patients)	40
(2) Bilateral (20 patients) ..	40	Two-stage unilateral (5 „)	10

Clinical Material

Of the patients operated on 50 per cent. were in a far advanced stage of the disease and 42 per cent. were advanced cases. While many of those with very extensive disease had responded to artificial pneumothorax and routine sanatorium treatment, some had failed to show such a response, and internal pneumolysis was carried out in these cases more or less as a last resort.

On admission to the sanatorium the patients were grouped according to the Ministry of Health classification, as follows:

TABLE II.—*Clinical Material* (*235 Cases*)

	No.	Per cent.
TB minus	16	7
TB + 1	2	1
TB + 2	99	42
TB + 3	118	50

Operative Results

The numbers and percentages given refer to artificial pneumothoraces.

TABLE III.—*Results in 255 Pneumothoraces*

Operative Result	No.	Per cent.
Complete	86	34
Partial	140	55
Inoperable	29	11

Complete: All the adhesions seen during the operation cauterized.
Partial: Some of the main adhesions cauterized wholly or partially.
Inoperable: The main adhesions deemed completely uncauterizable.

Complete division of adhesions was possible in only 34 per cent. Jacobaeus (1923) in his early cases obtained a complete collapse in 75 per cent., Chandler (1937) in 50 per cent., Gullbring (1934) in 73 per cent., and Anderson and Alexander (1937) in 37 per cent. The results reported by Jacobaeus, Chandler, and Gullbring were apparently obtained in cases selected as likely to be suitable for the operation, and show a high percentage of technical successes. On the other hand, Anderson and Alexander operated on 111 cases selected from 627 patients undergoing artificial pneumothorax treatment and obtained complete collapse in only 37 per cent. Alexander believes that less than 25 per cent. of patients undergoing artificial pneumothorax treatment are suitable for internal pneumolysis.

In the present series all patients undergoing artificial pneumothorax treatment were submitted for the operation with the exception of a few (less than 10 per cent.), for whom it would obviously have been futile. The results therefore suggest that complete collapse can be obtained by this method in over 30 per cent. of all cases of artificial pneumothorax. Adhesions were partially divided in 55 per cent. (Anderson and Alexander (1937), 41.4 per cent.) and were completely inoperable in 11 per cent. (Anderson and Alexander, 21.6 per cent.). Comparison of the results in this series of unselected cases with the results obtained by Anderson and Alexander in a selected series suggests that Alexander's estimate that less than 25 per cent. of all cases of artificial pneumothorax are suitable for the operation is much too low.

Radiological Result

The result is classified as "satisfactory" when the diseased area is fully collapsed and when cavities, if present before operation, are closed. "Improved, not satisfactory," indicates an improved but not complete collapse, and cavities, if present before operation, are not closed.

TABLE IV

Radiological Result	No.	Per cent.
Satisfactory	100	39
Improvement not satisfactory	35	14
Unaffected	71	28
Partial Symphysis	25	10
Obliterated	24	9
Total	255	100

X-ray films taken before operation were compared with those taken two weeks after operation and with subsequent films, in most cases six months after operation and in some up to nine and twelve months or longer. The radiological results are therefore based in most cases on a series of films, and not on films taken immediately before and after operation. Films taken immediately after operation were found to be misleading in estimating the degree of collapse, as even in inoperable cases they showed an improvement in the collapse chiefly in those parts of the lung in which there was little or no infiltration. This improvement was temporary. The results reveal that the collapse was improved radiologically in 53 per cent. and that the operation was unsuccessful in 47 per cent. in producing a better collapse.

TABLE V.—*Comparison between the Operative and the Radiological Result*

Operative Result	Radiological Result					
	No.	Satisfactory	Imp. not sat.	Unaffected	Partial Symph.	Oblit.
Complete	86	61 (71%)	12 (14%)	2 (2%)	7 (8%)	4 (5%)
Partial	140	39 (28%)	23 (16%)	42 (30%)	18 (13%)	18 (13%)
Inoperable	29	0	0	27 (93%)	0	2 (7%)
Total	255	100	35	71	25	24

The successful division of all the adhesions present does not always result in a radiologically satisfactory collapse. After complete division of adhesions, cavities still persisted in 14 per cent., and in 13 per cent. partial or complete obliteration of the pneumothorax followed. In 71 per cent. of pneumothoraces in which all adhesions were divided a radiologically satisfactory result was obtained. Where adhesions were partly divided, radiologically satisfactory results were obtained in 28 per cent., improved but not satisfactory collapse in 16 per cent., and partial or complete obliteration in 26 per cent.; the collapse was unaffected in 30 per cent. In the inoperable group the collapse was unaffected in 93 per cent. and the pneumothorax obliterated in 7 per cent. Partial or complete obliteration of the pneumothorax not infrequently follows the operation (19 per cent.). It is more likely to occur after partial division of adhesions (26 per cent.) than after complete division (13 per cent.).

Comparison is made in Table VI between the radiological result and the position of the principal adhesions

TABLE VI.—*Position of the Remaining Adhesions*

Radiological Result	Med. Subap.	Med. Apical	Apical Symph.	Lat. Apical	Others	Total
Satisfactory	22	10	3	1	3	39
Improvement not satisfactory	0	13	8	2	0	23
Unaffected	0	5	33	1	3	42
Part. symph.	1	4	11	1	1	18
Obliterated	3	7	6	1	1	18
Total	26	39	61	6	8	140

remaining after partial cauterization. These adhesions were classified as follows: (1) *Medial subapical:* the apex of the lung below the clavicle with the adhesions to the mediastinum below the clavicle. (2) *Medial apical:* the apex of the lung above the clavicle with adhesions to the medial thoracic wall above the clavicle. (3) *Apical symphysis:* lung adherent to the pleural cupula. (4) *Lateral apical:* adhesions to the lateral thoracic wall above the second rib in the midclavicular line.

As partial division of adhesions resulted in radiologically satisfactory collapse in 28 per cent. of cases it is of interest to note the position of the adhesions that were left undivided. In all cases in which medial subapical adhesions were left undivided a satisfactory collapse was obtained, except in four, in which partial or complete symphysis occurred. As these adhesions are usually attached to important mediastinal structures, their division is often difficult and dangerous. When difficulties arise in dealing with these adhesions and when the apex of the lung is below the clavicle they may be left undivided without interfering with the efficiency of the pneumothorax.

Satisfactory results were much less frequent when medial apical adhesions were left undivided. Of those in which a satisfactory collapse was obtained five had upper-lobe cavities below the level of the clavicle, and these closed after the division of lateral or lateral apical adhesions. In the remaining five there were no cavities before operation. In cases with cavities below the level of the clavicle the division of lateral or lateral apical adhesions may result in closure of the cavities even in the presence of an inoperable medial apical adhesion. Similarly, in cases in which an apical symphysis was left after operation the few satisfactory results followed the division of lateral or lateral apical adhesions where the cavities were below the level of the clavicle before operation. The division of such adhesions is therefore worth attempting.

TABLE VII.—*The Radiological Result in TB + 2 and TB + 3 Cases*

Classification	No. of A.P.s	Satisfactory		Imp. not sat.		Unaffected		Part. Symph.		Oblit.	
		No.	%	No.	%	No.	%	No.	%	No.	%
TB + 2	94	48	51	12	13	15	16	9	9	10	11
TB + 3	124	42	34	22	18	36	29	14	11	10	8

A satisfactory radiological result was more often obtained in TB + 2 cases (51 per cent.) than in TB + 3 cases (34 per cent.). The operation did not affect the collapse in TB + 2 cases in 16 per cent. and in TB + 3 cases in 29 per cent. Partial and complete symphysis occurred in similar proportions in TB + 2 and TB + 3 cases. As would be expected the more advanced the disease the less successful is the operation in producing satisfactory collapse, though advanced disease (TB + 3) does not contraindicate the operation, as it resulted in a satisfactory collapse in 34 per cent. of cases in this group.

TABLE VIII.—*Comparison between Temperature before and Temperature after Operation*

Temp before Op.	No. of Ops.	%	Temperature after Operation							
			Transient						Prolonged	
			<99°		<100°		>100°		>100°	
			No.	%	No.	%	No.	%	No.	%
<99°	185	71	42	23	84	45	48	26	11	6
99°–100°	59	23	2	3	22	37	24	41	11	19
>100°	16	6	0	0	2	12	2	12	12	75
Total	260	100	44	17	108	42	74	28	34	13

Most of the operations were performed on patients without pyrexia (71 per cent.), of whom 23 per cent. had no reaction after the operation; transient reactions with pyrexia of less than 100° F. occurred in 45 per cent., and with pyrexia greater than 100° in 26 per cent.; in 6 per cent. prolonged pyrexia followed the operation. In the group with pyrexia between 99° and 100° before operation 3 per cent. were apyrexial, 37 per cent. had transient pyrexia of less than 100°, 41 per cent. had transient pyrexia greater than 100°, and 19 per cent. had prolonged pyrexia after operation. In the group with pyrexia

greater than 100° before operation 75 per cent. had prolonged pyrexia greater than 100° after operation, and in most cases a more marked pyrexia than before operation, while in the remainder the temperature began to settle after the operation was performed.

Temperature reactions are more likely to occur and are more likely to be severe in cases with any degree of pyrexia, but as the operation was followed by a reduction in temperature in some of these cases, pyrexia does not contraindicate the operation in patients in urgent need of it.

Complications

TABLE IX.—*Complications (260 Operations)*

	No.	%
(1) Perforation of Lung ..	6	2.3
(2) Haemorrhage :		
(*a*) Severe	1	0.4
(*b*) Slight	6	2.3
Total	7	2.7

	No.	%
(3) Pleural effusion* :		
(*a*) Transient	20	8.4
(*b*) Persistent (TB −) ..	26	10.9
(*c*) Persistent (TB +) ..	32	13.5
Total	78	32.8

* Omitting twenty-three cases with effusion at time of operation, leaving a total of 237 operations.

Perforation of lung occurred in six cases (2.3 per cent. of operations), in five of which an unsuccessful attempt was made to release a cavity closely attached to the thoracic wall. In the sixth case a complete collapse was obtained after a very extensive cauterization.

Haemorrhage occurred in seven cases (2.7 per cent.). In six it was slight, and was easily controlled with the cautery at low heat. In one case there was an alarming haemorrhage. While working near the apex, blood suddenly covered the lens of the thoracoscope, and several attempts to find the bleeding-point failed. As the patient was becoming collapsed, the cannulae were withdrawn and the head of the bed tilted down. Routine treatment for haemorrhage and shock resulted in recovery, though a temperature reaction lasted many weeks. The pneumothorax was maintained with difficulty, as partial symphysis took place.

Small amounts of fluid in the costo-phrenic angle are common in artificial pneumothorax. A pleural effusion is therefore defined as any quantity of fluid sufficient to cover the diaphragm in the upright position, and all cases with this amount of effusion or more at the time of operation are omitted. Effusions are divided into three classes: (1) transient —those which disappear in a few weeks; (2) persistent (TB −) —those which slowly or rapidly increase and in which tubercle bacilli were never found; (3) persistent (TB +)—as (2), but in which tubercle bacilli were found.

In this series of operations effusions occurred in 32.8 per cent. 8.4 per cent. being transient and 24.4 per cent. persistent. Owing to the lack of a definition of what constitutes an effusion in much of the published work on this subject, it is difficult to compare these figures with those of others. Jacobaeus (1933) in an early series of cases found effusions after operation in 52 per cent., Chandler (1937) in 39 per cent., Anderson and Alexander (1937) in 33.3 per cent., Matson (1935) in 50 per cent., and Brock (1938) in 35.5 per cent. (including 22.5 per cent. classified as "very small amount").

Tuberculous effusions followed the operation in 13.5 per cent. Chandler (1937) had tuberculous empyema in 1.9 per cent., Anderson and Alexander (1937) in 3.6 per cent., and Brock (1928) in 1.4 per cent. of cases. These authors do not state what bacteriological methods were used in examining specimens of fluid for tubercle bacilli. In the present series all specimens were examined by direct film and culture on Loewenstein medium.

TABLE X.—*Comparison between the Radiological Result and the Incidence and Type of Effusion (omitting Inoperable Cases and those with Effusion at Operation)*

Type of Effusion	Radiological Result											
	Operations		Satisfactory		Imp. not satis.		Unaffected		Part. Symph.		Oblit.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Nil	137	64	72	52	26	19	31	23	3	2	5	4
Transient ..	19	9	13	68	2	11	1	5	2	11	1	5
Persist. TB − ..	26	12	6	23	2	8	7	27	4	15	7	27
Persist. TB + ..	31	15	4	13	3	10	4	13	14	45	6	19

Transient effusions had apparently little or no adverse effect on the result of the operation. Satisfactory results in the presence of a transient effusion (68 per cent.) were slightly more frequent than in cases in which no effusion occurred (52 per cent.), but with transient effusions partial symphysis was also more frequent (11 per cent.) than in the absence of an effusion (2 per cent.). Persistent effusions had a definitely adverse effect on the result of the operation. Satisfactory results were much less frequent (for TB negative effusions 23 per cent. and for TB positive effusions 13 per cent.), and the increased incidence of partial symphysis and obliteration was striking, being most marked in TB positive effusions. A persistent effusion is therefore a complication that is likely not only to render the operation valueless but may also lead to the obliteration of a pneumothorax, which, though partial, may nevertheless be of use in some cases.

In view of the disastrous effects of persistent effusions on the results of the operation the relation between the incidence and type of effusion and the severity of the disease (as shown by the Ministry of Health classification), the degree of pyrexia at the time of operation, the sedimentation rate before operation, and the extent of tissue cauterized were investigated. The results are shown in Tables XI to XIV.

TABLE XI.—*Incidence and Type of Effusion in TB + 2 and TB + 3 Cases*

Classification	No. of Ops.	Incidence of Effusion		Type of Effusion					
				Transient		Persistent TB −		Persistent TB +	
		No.	%	No.	%	No.	%	No.	%
TB + 2 ..	84	25	30	10	40	8	32	7	28
TB + 3 ..	116	46	40	9	19	15	33	22	48

As would be expected the incidence of effusion is greater in TB + 3 cases than in TB + 2 cases. In addition, in TB + 3 cases persistent effusions are more common and transient effusions less common than in TB + 2 cases. Thus in TB + 3 cases effusions are not only more frequent than in TB + 2 cases, but persistent effusions which have often been shown to lead to partial symphysis or obliteration of the pneumothorax are the most common type to occur in this group of cases.

TABLE XII.—*Comparison between the Temperature before Operation and the Incidence and Type of Effusion after Operation (omitting Cases with Effusion before Operation)*

Temp. before Operation	No. of Ops.	Effusions		Type of Effusion					
				Transient		Persistent TB −		Persistent TB +	
		No.	%	No.	%	No.	%	No.	%
<99° ..	168	47	28	18	38	15	32	14	30
99°–100° ..	55	23	42	2	9	10	43	11	48
>100° ..	14	8	57	0	0	1	12	7	88

In patients without pyrexia at the time of operation not only were effusions less frequent than in those with any degree of pyrexia, but effusions of the persistent type were also less frequent. Even with slight pyrexia effusions were much more common (42 per cent.), and of these over 90 per cent. were persistent. With more marked pyrexia, effusions occurred in almost 60 per cent., and of these 88 per cent. were persistent TB +. It must be remembered, however, that the pyrexial TB + 3 case is the one likely to form an effusion without internal pneumolysis. Consequently, though it is desirable to await a fall in temperature in these cases, careful scrutiny should be maintained lest an effusion form and make internal pneumolysis impossible. A clinical estimate is necessary before performing the operation.

TABLE XIII.—*Comparison between the Sedimentation Rate before Operation and the Incidence and Type of Effusion after Operation (omitting Cases with Effusion before Operation)*

S.R. before Operation	No. of Ops.	Effusions		Type of Effusion					
				Transient		Persistent TB −		Persistent TB +	
		No.	%	No.	%	No.	%	No.	%
Slow ..	73	18	25	10	56	6	33	2	11
Moderate ..	120	38	32	9	24	15	39	14	37
Rapid ..	44	21	48	1	5	5	24	15	71

In patients with slow sedimentation rates at the time of operation effusion occurred in 25 per cent., and of these 56 per cent. were transient and 44 per cent. persistent; whereas, with rapid sedimentation rates, effusions followed cauterization in 48 per cent., of which 95 per cent. were of the persistent type and 71 per cent. were TB positive. As with temperature, delay is desirable before operating if sedimentation is rapid. Only operations urgently necessary should be undertaken in patients with a rapid sedimentation rate—for example, adhesions holding a cavity with evidence of bronchogenic spread in the other lung.

TABLE XIV.—*Comparison between the Extent of Cauterization and the Incidence and Type of Effusion (omitting Cases with Effusion before Operation)*

Extent of Area Cauterized	No. of Ops.	Effusion		Type of Effusion					
				Transient		Persistent TB −		Persistent TB +	
		No.	%	No.	%	No.	%	No.	%
Small ..	36	10	28	5	50	2	20	3	30
Moderate ..	127	47	37	13	28	16	34	18	38
Extensive ..	52	21	40	2	10	8	38	11	52

Where only a few small adhesions were cauterized, effusions occurred in 28 per cent., of which 50 per cent. were transient. The incidence of effusions was much the same after moderate and after extensive cauterization, but in the extensive group there is a much greater incidence of persistent effusion of the TB + type.

It is obvious that advanced disease or any degree of pyrexia or a rapid sedimentation rate is associated with a greatly increased tendency to fluid formation, and particularly to tuberculous empyema. In the presence of any or all of them the possible benefits of the operation must be very carefully weighed against the greatly increased possibility of tuberculous effusions, and especially where an extensive cauterization is likely to be needed.

Radiology in estimating Suitability of Adhesions for Cauterization

Experience with the thoracoscope has shown that with the present methods of radiological examination it is impossible accurately to localize adhesions or to estimate their number and extent or their suitability for cauterization. Radiological shadows which suggest cord-like adhesions are often found at thoracoscopy to be sheets of adhesions, many of which may also be hidden by visible adhesions or by the lung, or may be too thin to show on an ordinary film. In this series an attempt was made to estimate the suitability of adhesions for cauterization by examining antero-posterior films taken before operation. Only those cases in which the greater part or the whole of the apex of the lung appeared radiologically to be directly adherent to the thoracic wall were considered inoperable. The figures given show the result of attempting to cauterize adhesions which, on radiological evidence, appeared to be inoperable owing to the presence of an extensive apical symphysis.

TABLE XV.—*Operative and Radiological Results in Cases with an Apical Symphysis Radiologically before Operation*

Radiological Result	Operative Result				
	Complete	Partial	Inoperable	Total	
				No.	%
Satisfactory	Nil	2	0	2	4
Improvement not satisfactory ..	Nil	3	0	3	7
Unaffected	Nil	14	16	30	65
Partial symphysis	Nil	4	0	4	9
Obliterated	Nil	6	1	7	15
Total	Nil	29 (63%)	17 (37%)	46	100

In every case the radiological diagnosis of an apical symphysis was confirmed at operation. It was not possible in any of the cases to free the apex completely. Satisfactory results were obtained in only two instances. In these there were cavities in the middle third of the lung; they were collapsed after division of adhesions to the thoracic wall above the level of the cavities. In three cases there was some improvement of the collapse with diminution in the size of the cavity following division of the outer part of the symphysis.

In many cases the area of lung closely adherent to the thoracic wall at the apex was found at operation to be much greater than it appeared to be radiologically. In several instances there was a symphysis from apex to base posteriorly, though radiologically the symphysis seemed to be confined to the apex. In every case in which the cavity was situated close to the apex the operation had no appreciable effect, even when lateral apical adhesions were successfully divided.

Discussion

Here are reported the results of internal pneumolysis in an unselected series of cases of pulmonary tuberculosis undergoing treatment by artificial pneumothorax. The indication for the operation was the presence of adhesions over the diseased area of lung, and in most cases these were associated with uncollapsed cavities. The decision as to the suitability of adhesions for cauterization depended on a thorascopic examination, though in a few cases the size and position of the pneumothorax in relation to the diseased area showed that thoracoscopy would be valueless or impossible, and accordingly they were not submitted to the operation. Apart from these few cases there was no selection, and the results show the value of the operation of internal pneumolysis in unselected cases of artificial pneumothorax.

The figures given reveal once again the deplorable fact that 50 per cent. of patients treated by artificial pneumothorax were classified TB + 3, and that even in this unpromising material a satisfactory collapse was obtained in 34 per cent., though the incidence of effusions in this group was much greater than in patients with less advanced disease. In TB + 2 cases a satisfactory collapse resulted in 51 per cent.

All adhesions were completely divided in 34 per cent. of pneumothoraces, and radiological examination of these showed a satisfactory collapse in 71 per cent. Complete cauterization of adhesions, therefore, does not always result in a satisfactory collapse, this being due in some cases to effusion, and in others to thick-walled cavities, which in spite of complete relaxation do not close. In 55 per cent. only partial division of adhesions was possible, and of these 28 per cent. showed a satisfactory collapse radiologically.

After partial cauterization it has been found that the position of the remaining adhesions and their relation to cavities have an influence on the efficiency of the collapse. In some positions adhesions are more likely to interfere with efficient collapse than in others. Where the apex of the lung has dropped below the clavicle, medial subapical

adhesions do not prevent the closure of cavities in the upper lobe. These adhesions are usually attached to important structures in the superior mediastinum, and access to them is often difficult; cauterization, too, is dangerous in this area. Such adhesions may be left undivided unless they can be dealt with easily and safely. Medial apical adhesions are important, and should be divided if possible. They may be left, if access is difficult, where a cavity well below the clavicle is held by lateral adhesions that can be cauterized. Edwards and Stevens (1938) found that 42.3 per cent. of cavities uncollapsed by artificial pneumothorax closed after phrenic evulsion, and probably this operation is more effective in the presence of medial apical adhesions than any other type. An apical symphysis is usually inoperable, though parts of such adhesions are sometimes divisible. This, however, does not lead to any obvious improvement in the collapse and may result in the weakening of the walls of an adjacent cavity with perforation of the lung. Cauterization of lateral adhesions in the presence of an apical symphysis has no effect on apical cavities, but may result in closure of cavities below the level of the clavicle.

Apart from effusions there were few complications, though perforation of the lung occurred in 2.3 per cent. In one case (0.4 per cent.) there was a severe intrapleural haemorrhage, and the patient recovered after routine treatment for shock and haemorrhage. Small haemorrhages (2.3 per cent.) were easily controlled by applying the cautery at low heat to the bleeding-point. Varying degrees of surgical emphysema occurred in many cases, and in six it was severe, extending to the neck and abdominal wall. Apart from discomfort to the patient, no ill effects resulted. Mediastinal emphysema was not observed.

Pleural effusion was the most frequent complication, occurring in 32 per cent., excluding cases with effusion at the time of operation. Transient effusions followed the operation in 8 per cent., and persistent effusions in 24 per cent., more than half of which contained tubercle bacilli. Transient effusions had little or no effect on the result of the operation. Persistent effusions, and especially those containing tubercle bacilli, had a definitely adverse effect on the result of the operation, in many cases resulting in partial symphysis or obliteration of the pneumothorax.

In view of the adverse effects of effusions various factors likely to influence the production of effusions were investigated. Effusions, and especially TB + effusions, were much more common in TB + 3 cases. Tuberculous effusions were also more frequent in patients with any degree of pyrexia or a rapid sedimentation rate, or those in whom an extensive cauterization was performed. In dealing with such patients, therefore, the possible advantages of the operation should be carefully weighed against their much greater liability to effusions.

Radiological examination is unreliable in estimating the suitability of adhesions for cauterization; but if there is definite radiological evidence of an apical symphysis with an apical cavity the chances of a successful division of adhesions is extremely remote, and in these cases thoracoscopy is unnecessary. It is advisable, however, to make use of films of higher penetration than is customary in chest radiology, as films of the usual density may show what appears to be an apical symphysis, but which with a film of higher penetration is a series of separate adhesions. In a certain number of cases with upper lobe alhesions stereoscopic films of the upper half of the collapsed side were taken. While these were definitely more reliable than ordinary films in estimating the extent and position of adhesions, they were not accurate enough to warrant their use as a routine.

The age of the pneumothorax at which internal pneumolysis is performed is said by some authorities to influence the incidence of effusion and the success of the operation. In this series of cases the first 121 pneumothoraces were induced from three to nine months before the operation was performed. In this group complete collapse was obtained in 32 per cent., a radiologically satisfactory collapse in 44 per cent., effusions occurred in 37 per cent., and tuberculous effusions in 13.5 per cent. In the remaining cases the pneumothorax was induced eight to ten weeks before operation. Collapse was complete in 34 per cent., radiologically satisfactory in 35 per cent., effusions occurred in 29 per cent., and tuberculous effusions in 13.5 per cent. Operation more than three months after induction resulted in the division of all adhesions in the same percentage of cases as in those in which the operation was performed within three months of induction, but with a greater proportion of satisfactory radiological results. Effusions were more common in the former group, though the proportion of tuberculous effusions was the same in each. As these groups are probably not strictly comparable in other respects, it is doubtful if the slight differences observed in the results of the operation are significant; there is therefore no definite evidence to suggest that the age of the pneumothorax at which internal pneumolysis is performed, within the age limits stated, has any influence on the success of the operation or the incidence of effusions.

It has been suggested by several authors that the length of the operation has some influence on the result and should be limited to one hour. The extent of the area cauterized appears to have some relation to the incidence of effusion, but it seems unlikely that the time factor alone has any definite relation to the incidence of effusions. It is more probable that the amount of tissue destroyed by cauterization, together with the state of the pleura, is of more significance than the duration of the operation. The amount of tissue destroyed by the cautery in a given time may vary greatly in different patients, depending largely on the technical difficulties encountered, and, in addition, second and third sessions add to the risk of complications. The length of the operation is therefore not a safe guide in deciding on the necessity for a second session, and this should depend rather on the state of the pleura, the extent of the area cauterized, and the technical difficulties, together with the clinical condition of the patient and the sedimentation rate, always bearing in mind the added risk of later sessions.

Double Artificial Pneumothorax

In this series of twenty cases thoracoscopy was performed on the one side before attempting the artificial pneumothorax on the other. As many of these patients were acutely ill the reaction was severe. In the last twenty-nine cases of double artificial pneumothorax this fact has been taken into consideration. If a patient is in good or relatively good condition the thoracoscopy is performed on the one side before inducing the other. If, however, there is a very rapid sedimentation rate, high temperature, or other signs of an acute process in cases in which absolute bed rest alone has failed to reduce toxaemia, thoracoscopy has been postponed and the contralateral side induced at once. The main objection to this procedure is that these cases are liable to pleural effusion. Further, in the very acute cases with much destruction of lung, a phrenic evulsion is performed before doing a thoracoscopy, and this has often resulted in lessening the toxaemia.

Phrenic Evulsion and Thoracoscopy

Normally in cases suitable for a phrenic evulsion this is best performed after the thoracoscopy, as patients with a phrenic evulsion occasionally become short of breath during a thoracoscopy. However, in some cases of artificial pneumothorax with numerous adhesions and only a linear collapse, and where it is impossible to introduce a trocar for thoracoscopy, a phrenic evulsion will result in enough relaxation to permit a thoracoscopy with relative ease. Lastly, in cases of marked toxaemia the phrenic operation may be performed before thoracoscopy.

Summary and Conclusions

The results of internal pneumolysis in an unselected group of 235 cases, in 50 per cent. of which the disease was far advanced, are reported, including twenty with bilateral artificial pneumothorax.

Division of all adhesions was possible in 34 per cent. of pneumothoraces operated on, and partial division in 55 per cent.; 11 per cent. were inoperable.

Radiologically satisfactory results were obtained in 39 per cent., 14 per cent. were improved but not satisfactory, 28 per cent. were unaffected, and in 19 per cent. partial or complete symphysis followed the operation.

In the group of 140 pneumothoraces in which only partial division of adhesions was possible, a satisfactory collapse followed the operation in 28 per cent.

Medial subapical adhesions rarely interfere with efficient collapse where the apex of the lung is below the clavicle in the upright position.

Lateral or lateral apical adhesions may be usefully divided in patients with inoperable medial apical adhesions or apical symphysis in the presence of patent cavities below the level of the clavicle.

Satisfactory results were most frequent with limited lesions in apyrexial patients.

Apart from effusions, complications were rare. Following 260 operations, effusions occurred in 32.8 per cent. of operations (8.4 per cent. transient, 10.9 per cent. persistent TB negative, 13.5 per cent. persistent TB positive). Transient effusions did not materially affect the result of the operation. Results were poor where the operation was followed by persistent effusions, particularly those in which tubercle bacilli were present and the incidence of partial or complete obliteration was high.

Effusions were most common in cases with advanced disease, any degree of pyrexia, rapid sedimentation rates, or in cases where extensive cauterization was carried out. Consideration of the first three of these factors is of importance in estimating the probability of effusion following the operation.

The radiological diagnosis of an inoperable apical symphysis in forty-six cases was confirmed by thoracoscopy. Apart from this group, radiological examination was unreliable in determining the position or extent of the adhesions present. Stereoscopic examination was more reliable than fluoroscopy and antero-posterior films, but was not of enough value to warrant routine use.

Facilities for intrapleural pneumolysis are essential for the proper conduct of artificial pneumothorax treatment, and the operation may be of value even in advanced cases.

The place of double artificial pneumothorax and phrenic evulsion in intrapleural pneumolysis is indicated.

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Disturbances of Epiphysial Ossification.—The hip-joint is the site at which hereditary disturbances of epiphysial ossification may most often be found, but any epiphysis in the body may be affected. The condition has to be differentiated from Perthes's disease and allied abnormalities, but the non-traumatic form of osteochondritis dissecans is thought by the author to be closely related to it.—Multiple Hereditary Disturbances of Epiphysial Ossification. W. Müller.—*Z. Orthop.*, May 30, 1939, **69**, 257.

LABORATORY METHODS IN THE DIAGNOSIS AND CONTROL OF FEVERS OF THE ENTERIC GROUP*

BY

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In a very brief paper such as this it is impossible to do more than touch on a few of the principal points in which progress has been made in diagnosing and controlling fevers of the enteric group. To those who practise at home it may seem that the existing methods of laboratory diagnosis are adequate and satisfactory, but unfortunately in subjects who have been inoculated with typhoid-paratyphoid vaccine—and this includes practically all Europeans living over-seas—the usual serological tests give very equivocal and unreliable results. In the accompanying table the figures for the British and Indian Armies for the last ten years are shown. The cases classified as "enteric group" have been diagnosed on serological or clinical grounds, and there is good reason to believe that a considerable proportion of them are not true enteric group fevers. It is unlikely that there will be any notable increase in the number of cases diagnosed by cultural methods; for, in the Army, blood culture as well as faeces and urine culture is pursued relentlessly. In outbreaks of typhoid or paratyphoid fever, isolations are made from practically 100 per cent. of the cases: the enteric group cases in the table are mainly sporadic cases,

Table showing Incidence of Enteric Group Fevers in the Army in India (British and Indian Troops Combined)

		1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
Typhoid	Cases	227	293	200	176	161	137	105	82	43	42
	Deaths	33	41	21	25	21	26	16	16	5	?
Para A	Cases	45	58	68	64	67	52	53	59	27	25
	Deaths	—	—	1	3	1	1	—	3	—	?
Para B	Cases	18	9	6	10	10	3	4	1	2	2
	Deaths	—	—	—	—	—	—	—	—	—	?
Para C	Cases	4	12	9	4	1	3	3	—	1	
	Deaths	—	2	1	—	—	—	—	—	—	
Enteric Group	Cases	264	237	218	240	205	222	148	128	80	55
	Deaths	12	9	9	11	10	10	6	3	3	?
Total	Cases	558	609	501	494	444	417	313	270	153	124
	Deaths	45	52	32	39	32	37	22	22	8	?

in many of which the diagnosis has been made because nothing else seems to apply. It is obvious that a serological test capable of giving reliable positives and negatives would be of the greatest value.

The usual agglutination test made with suspensions of H or flagella antigen, eminently successful in the uninoculated, has now been completely given up in the military laboratories of India, for it has been conclusively shown that, in subjects inoculated with typhoid-paratyphoid vaccine, febrile conditions other than enteric group fevers produce an anamnestic rise of agglutinins not to be distinguished from that given by enteric infection. Routine tests are now being performed with suspensions of O antigen. These are undoubtedly more specific in their indications, being less influenced by the stimulus of non-

* Read at a joint meeting of the Sections of Services and Tropical Medicine and Public Health at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

enteric infections. Unfortunately the response is somewhat sluggish, and with Dreyer's technique many proved cases fail to show a diagnostic rise in agglutinin. Trials are now in progress using the more delicate technique advocated by Felix, and the results obtained to date give reason for hope that more reliable information will be forthcoming from this test.

The Vi Agglutination Test

The most recent method of serological diagnosis, which applies at present only to typhoid and not to paratyphoid infection, is a test for the presence of agglutinins for the virulence or Vi antigen, first described in detail by Felix. This test has a more complicated technique owing to the instability of the antigen. The original and probably the most delicate method of performing the test is with suspensions of living organisms, but difficulties in standardization and in reading the results make this a method for the expert. An alternative technique has been provided by the discovery of strains of *typhosum* which are devoid of H and O antigen and possess only Vi antigen. Preparations of such strains can be preserved by formalin without losing their properties, and in this way standardized suspensions can be prepared and issued from a central laboratory.

The Vi agglutination test was first used by Felix for the detection of carriers. In fifty-six chronic carriers he found Vi agglutinins present in every case, although in forty-seven the titre was 1 in 20 and under: with few exceptions all controls were negative. I am indebted to my colleague Major H. J. Bensted, *M.C.*, R.A.M.C., for some data, not yet published, on the results of this test carried out at the Enteric Laboratory, Kasauli, India. In the small number of permanent carriers which were investigated, appreciable amounts of Vi antibody were found in every case. In temporary and convalescent carriers, however, approximately half the cases failed to show Vi agglutinins despite the fact that the organisms were readily recovered from the stools. It would therefore appear that this test is likely to be of great assistance in detecting permanent carriers, but cannot be trusted to give a reliable negative in the routine examination of convalescents before discharge from hospital.

More recently Bhatnagar has applied this test to the diagnosis of cases of typhoid fever, and claims to have obtained an easily detected response in inoculated subjects and a less obvious result in uninoculated natives. The Vi agglutinins appear early and disappear quickly. Bensted, in investigating cases of typhoid fever proved by isolation of the organism, found that about 25 per cent. failed to show any Vi agglutinin when examined at short intervals beginning at the seventh day. In a small number of cases serum was obtained between the first and fifth days: in all of these Vi agglutinin was demonstrated in appreciable amounts. It would therefore appear that this test may be of considerable diagnostic value in the early days of the disease, and further investigations along these lines are being carried out.

Typing with the Vi Bacteriophage

In the realm of epidemiology a notable and important advance has recently been made by Craigie in the discovery of bacteriophage which has a specific action on virulent strains of *Bact. typhosum* (Kauffmann's V forms). Craigie has described four serologically different bacteriophages, and of these one, Type II, is of particular importance from the point of view of epidemiology. This phage has the property of becoming conditioned to the particular strain of *Bact. typhosum* on which it is propagated. Thus if it is propagated for some generations on the Rawlings strain it acquires a high titre for this strain, but shows a low titre for another well-known strain, Ty 2. If this same phage is now propagated for some generations on Ty 2 the position is reversed: it develops a high titre for Ty 2 and loses in large measure its power to lyse Rawlings. Extending these observations over a large number of strains, Craigie has differentiated at least thirteen phage-types of *Bact. typhosum*, some common, some rare, for each of which he has prepared a specific bacteriophage. He has also encountered a small number of strains, probably intermediate between virulent and non-virulent forms, which cannot be typed in this way. These he names "imperfect V forms."

Once the different conditioned phages are available it is a simple matter to type any strain of *Bact. typhosum*. To observe the action of the bacteriophage, a loopful of young broth culture of the organisms to be tested is spread with a standard platinum loop over an area the size of a sixpence on an agar plate. When this has dried, a drop of phage, also from the standard loop, is placed without spreading in the centre of this patch and allowed to dry. The plate is then incubated for two hours, stored in the cold room overnight, and reincubated next day. The results will be obvious in from four to six hours, and may show either a complete confluent patch of lysis the size of a drop of phage or varying numbers of small discrete plaques, or absence of any obvious lysis. For test purposes each of the different phages is carefully titrated and diluted to the strength which against its homologous type will just give a confluent patch of lysis. This "critical test dilution" usually lies between strengths of 1 in 100 and 1 in 10,000 of the original phage, and has little or no action on heterologous types—at most it produces an occasional pinhead plaque which need cause no confusion.

To type an unknown strain a series of patches are sown, from a young broth culture, on an agar plate. These are spotted separately with the different type phages, and incubated as described. A disk of lysis is produced by the phage of the type to which the strain belongs. The phages used are phage I (a polyvalent phage not hitherto mentioned, included to confirm that the strain under test contains Vi antigen) and phage II B_2, C, D_2, E_2, F_2, G, H, and J. Phage A is omitted, as *typhosum* Type A is equally susceptible to the action of all phages. Phages B_2, D_2, E_2, and F_2 act equally on Types B_1, D_1, E_1, and F_1 respectively. If the strain being tested is lysed by one of these phages it must be further tested with phage B_1, D_1, E_1, and F_1, as the case may be: these are strictly specific for their homologous types. Imperfect V forms will be lysed by phage I and imperfectly by some of the phage II types. W forms will show no lysis at all.

Accumulating experience goes to show that the phage type of a strain is a permanent character, unaffected by passage through the human being, by artificial passage through laboratory animals, or by artificial culture. Thus the Ty 2 and Rawlings strains, which are in use in various parts of the world, have proved to be Types E and F respectively, wherever tested. The Rawlings strain now used at the Royal Army Medical College has been passed through mice on innumerable occasions, and still remains F; while in outbreaks of typhoid fever the organisms recovered from all cases prove to be alike, and repeated isolations from the same case are also of one

type, although occasionally imperfect V forms and W forms may be recovered from a case which also shows V forms of a definite type. This, of course, is a quantitative and not a qualitative difference in antigen.

Applications of the Bacteriophage Test

The applications of this test are manifold. It affords evidence which may either link up on a suspected carrier with an outbreak or may disprove his connexion with it. Thus the strain which caused the Croydon outbreak was Type D. The carrier suspected of having fouled the water supply which spread the infection also harboured an organism of Type D.

Recently the laboratory assistant of a colleague, who is engaged in the preparation of typhoid-paratyphoid vaccine, developed typhoid fever twelve days after he returned from leave. The question of laboratory infection naturally arose. The strains in use in the laboratory were Rawlings and Watson (F), Ty 2 (E), and a strain called Giglioli, which proved to be A. The strain recovered from the attendant was C, thus proving that the infection had not been acquired in the laboratory, but was probably picked up while he was on leave.

A short time ago an outbreak occurred in Birkenhead which was traced to an infected milk supply; but one case, occurring under rather different circumstances, could not be fitted into this picture. The associated cases of the outbreak proved to be caused by Type E. The anomalous case harboured Type D, thus confirming that it was a sporadic case of different origin.

In commenting on Craigie's work an annotation in the *British Medical Journal* (1938, **2**, 1212) suggested that his methods were unlikely to come into common use, presumably in the belief that the test was very intricate. This is far from being the case, and I hope that the remarks I have made and the demonstration I have put out will dispel this idea and will show that the test is simple and the results refreshingly clear-cut.

To summarize, we have in the Vi agglutination test a promising method of detecting permanent carriers, and in Vi bacteriophage an extremely delicate and accurate means of studying certain aspects of the epidemiology of the disease.

The Joint Committee set up under Subsection (1) of Section 4 of the Therapeutic Substances Act, 1925, has made further regulations (Statutory Rules and Orders, 1939, No. 1395). These Therapeutic Substances Amendment Regulations, 1939, come into operation on December 1 next. They require every holder of a licence to manufacture therapeutic substances, who for any purpose engages in the culture or manipulation of pathogenic spore-bearing micro-organisms, to provide separate laboratories and utensils and apparatus for the culture or manipulation of such micro-organisms. These laboratories and appliances are not to be used for the manufacture of any other therapeutic substance. Part I of the attached schedule lays down provisions applicable to tetanus toxoid, and Part II provisions applicable to gas-gangrene antitoxin. Tetanus toxoid is defined as "tetanus toxin (the sterile filtrate from a culture on nutrient broth of *Clostridium tetani*) the specific toxicity of which has been completely removed by the action of chemical substances in such a manner that it retains efficient properties as an immunizing antigen. Its proper name is 'tetanus toxoid.'" Gas-gangrene antitoxin is defined as "the serum, or the antitoxic globulins, separated from the blood of animals which have been immunized against the specific toxin prepared by the growth of *Clostridium histolyticus* in a fluid medium. The proper name of the substance is 'gas-gangrene antitoxin (histolyticus).'"

CANCER: A CONSIDERATION OF CURABILITY AND OF THE ROLE OF RADIOTHERAPY IN TREATMENT*

BY

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The main purpose of this paper is to try to analyse the part which radiotherapy is capable of playing in the treatment of malignant disease, and to consider certain of its limitations. The term "radiotherapy" should be used to include both radium and deep *x*-ray therapy; to obtain maximum efficiency of treatment policy these agents must be in the same hands. In particular I feel that the respective fields of surgery and radiotherapy—and these two between them remain the only available methods of curing cancer—are much better defined than is generally supposed. Analysis of the proper part which each should play is therefore practicable. Certain of the ideas which I propose to lay before you were suggested by study of a most interesting Ministry of Health publication, "Cancer: An Inquiry into the Extent to which Patients receive Treatment," by Sholto Mackenzie.† I shall have occasion to make frequent reference to that report.

The best approach to the main theme of the role of radiotherapy in malignant disease seems to require as preliminary some consideration of the more basic questions of the extent to which malignant disease is normally curable by any means; to what extent it calls for some treatment even though not necessarily curative in intent; and, lastly, the extent to which in spite of all our knowledge and accomplishments of the last twenty-five years cancer is still a hopeless disease. In Mackenzie's report the subject was approached from the completely objective standpoint of finding out the extent to which certain types of cancer were in fact receiving treatment in this country to-day, as assessed from a detailed analysis of all the cancer deaths in a number of sample areas, no account being taken of possible cured cases. It seemed to me, however, that collateral evidence of value could be built up from a rather more subjective point of view by considering how far the various methods and technical facilities at our command have been proved in practice to be effective or otherwise in dealing with each of the known types of malignant disease.

This subjective survey shows that for each disease type the many manifestations of malignancy fall into groups so near those proposed by Mackenzie that I have taken his three groups as a satisfactory index of the present-day state of affairs. These three groups are shown in Tables I, II, and III. It must be noted that the percentages shown on these tables are not results of treatment, but are the percentages of all cases of registered cancer deaths in the sample communities tested which were found to have received treatment. For his analysis Mackenzie took "treatment" to mean treatment of practically any sort, except palliative surgery, under-

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* Paper read to the Section of Surgery at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

† Reports on Public Health and Medical Subjects, No. 89.

taken at any hospital or nursing home, and made no attempt to judge of its efficiency.

TABLE I.—*"Curable" Malignant Disease: Percentage treated*

Uterus, body and cervix, and vagina	56%
Skin, including genitalia	64%
Breast	68%
Mouth, tongue, etc., and lip	71%

The lesions in Table I are called the "curable" diseases in that not only has statistical survey shown that these four conditions can be cured in a worthwhile percentage of cases treated, but experience shows that where adequate treatment facilities exist they are being cured in an appreciable percentage of all cases occurring. Even this is using the word "curable" in a very limited sense when we find that such percentage is somewhere in the region of 25 to 30, and Sholto Mackenzie is only willing to call them "the treatable cancers." Later it will be necessary to emphasize that in this group the general curability is associated with such a high cure rate in the early stages that these four diseases in such early stages can genuinely be called curable even by the standards of other diseases.

The striking fact about these lesions is that they are accessible cancers, diagnosable either on sight or by palpation, and that they require no elaborate or technical means of diagnosis.

TABLE II.—*"Treatable" Malignant Disease: Percentage treated*

Stomach	5%	Bladder	29%
Intestine	8%	Ovary	29%
Prostate	18%	Larynx	39%
Rectum	20%	Miscellaneous	42%

Table II presents a longer series, the common characteristic of which is that permanent cure can only be expected in a small percentage of all cases. They are, however, "treatable" diseases in one of three ways. From the surgical point of view certain of them can be labelled "treatable" in the sense that if fortunate enough to be explored in their really early stages they *can* be successfully cured by surgical excision. From the radiological point of view they are treatable in the same sense that a small fraction of the early cases can be cured. Thirdly, they are treatable by radiological methods in another sense altogether—namely, that the majority of cases call for the use of radiation as a palliative agent. It must be realized that the fraction of the total cases occurring which would be cured would still remain comparatively low even were full use made of all present-day diagnostic facilities. It is indeed somewhat of a shock to realize for the first time the extent to which this is the case for so many common cancers, but no good purpose is served by ostrich tactics. Had I not been following the Mackenzie grouping, there would have been some temptation to place carcinoma of the rectum in the first group because of its 20 to 25 per cent. curability by operation; but, even so, this means but little when four out of five cases are inoperable when first seen. Even this dubiety hardly exists, however, in the other lesions. The subject of carcinoma of the stomach, for instance, an extremely common lesion, was discussed at length at the British Empire Cancer Campaign Informal Congress two years ago, and the outstanding impression left by a frank discussion was that, even considering only treated cases, the long-term survivals in this disease represented a negligible fraction.

TABLE III.—*"Incurable" Malignant Diseases: Percentage treated*

Liver	0%	Gall-bladder, etc.	10%
Pancreas	1%	Mediastinum	14%
Lung and bronchus	5%	Oesophagus	21%

Table III lists those lesions in which we can still offer so little that we are forced to admit the label "incurable," and to realize that treatment even from a palliative point of view is largely only of psychological value. Again, if making a list *de novo* one might be tempted to pass carcinoma of the oesophagus and perhaps of the mediastinum upwards into the "treatable" group, with as much right to a place there as other lesions in that group. Apart from that, medicine has still little to offer in any of these fields, as is shown by the very low percentages in which treatment has even been attempted.

With this introduction the extent to which radiotherapy as a method of treatment can be fitted into the general scheme must be examined and its relation to surgical methods considered. It seems easiest to present in tabular form the conclusions which I think may be arrived at by analytical study of the material. For this purpose I should like to submit for consideration a classification of malignant disease in relation to treatability by radiotherapy which I recently drew up.* It is inevitable that a few of the points raised in that paper be mentioned again.

It must be appreciated that such tabular methods do not allow for finer shades of classification and, moreover, that it is only possible to catalogue the state of affairs at the present time, forgetting temporarily the promise that radiotherapy will open up further fields as treatment technique develops.

TABLE IV.—*Radiotherapy Usually Contraindicated; Surgery indicated where Lesions are "Operable"*

Carcinoma of stomach. Carcinoma of colon and intestine. Carcinoma of rectum
The connective-tissue sarcomas—for example, osteogenic sarcoma, fibrosarcoma
Most advanced malignant diseases

Taking the bleakest aspects first, we find in Table IV those lesions in which radiotherapy has been adequately proved to have little or nothing to offer. Several of the lesions listed are treatable surgically in their early stages; others are equally hopeless to surgical approach. The sarcomas, if inoperable, may be palliated temporarily, but the fact that treatment is primarily surgical must never be forgotten. In regard to advanced malignant disease, I feel that it is important for the practitioner and the surgeon to learn to accept the therapist's ruling of "beyond radiation," just as in the surgical field "inoperable" is accepted as a legitimate judgment. Far too often unwillingness to accept such a ruling, mostly in the desire to "get something done—it really does not matter what," means that the patient's few remaining weeks or months are made much more distressing than they might have been had the situation been frankly faced and the best use made of opium, that greatest of Nature's drugs in the last resort.

TABLE V.—*Radiotherapy of Some, but Limited, Value. Usually Palliative—only rarely Curative*

Carcinoma of pharynx and larynx
Carcinoma of bladder (late) and prostate
Carcinoma of oesophagus
Carcinoma and sarcoma of lung and mediastinum
Cerebral tumours

* Paterson, Ralston, "Cancer from the Point of View of the Radiotherapist," *Brit. J. Radiol.* (in press).

In Table V are listed those forms of malignant disease where radiotherapy is called for as treatment, but in which its very considerable limitations must also be realized. For the most part surgery is out of the question either because of the site of the growth or because it is so often diagnosed late. In one respect this is an experimental field in that much is being done to-day to try to extend the known though limited curative potentialities of radiation. In another sense it is a field in which, along with later cases of other groups, radiation, though not curative, has much to offer in its genuine palliative value. This palliative function of radiotherapy is something comparatively new in cancer therapy, because surgery by its very nature, except in the rare instances of colostomy and gastrostomy, functions chiefly as a curative device. The palliative aspects of radiotherapy certainly merit consideration quite apart from the question of cure or five-year survival. Such palliation may take the form of prolongation of life for periods of months up to several years. What seems, however, of greater importance is its capacity to relieve the manifold distressing symptoms associated with gradual extension of the malignant process—the arrest of haemorrhage or discharge, the cleaning up of foul and ghastly ulcers, the easing of dyspnoea or dyspha gia, and, most important of all, relief of pain in many cases.

TABLE VI.—*Radiotherapy the Treatment of Choice: I, Tumours of High Radiosensitivity*

(i) *Embryonal origin:*
- Seminoma testis
- True embryonal tumour of ovary

(ii) *Primitive tumours of unknown origin:*
- Wilms's tumour of kidney
- Some tumours of thyroid glands
- Some tumours of salivary glands
- Some tumours of nasopharynx and nasal accessory sinuses

(iii) *Reticulo-endothelial origin:*
- Leukaemia
- Hodgkin's disease (lymphadenoma)
- Lymphosarcoma (reticulosarcoma)
- Thymoma
- Ewing's tumour
- Endothelioma (of vascular origin)
- Miscellaneous reticulo-endothelial diseases

The third group I have proposed is one showing those lesions which from the point of view of the radiotherapist seem to be his special field. These fall into two distinct subgroups. The first is an interesting and fascinating series of radiosensitive tumours in which, when first given, *x*-ray therapy seems to work magic. The curative possibilities are real but still not high, and the palliative results are of a very high standard indeed. This group is one in which no clash with surgery can arise, as few, if indeed any, of the lesions are amenable to surgical control alone.

TABLE VII.—*Radiotherapy the Treatment of Choice: II, Tumours of Moderate Sensitivity in Accessible Sites*

Carcinoma of:

Mouth, tongue, and lip	Anus
Skin (face and hands)	Bladder (if limited)
Cervix uteri	Maxillary antrum
Vagina	

Table VII is perhaps rather more controversial. It is presented nevertheless in the firm belief that to-day only a minority of surgeons with any real experience of the achievements of radiation in these fields, especially by radium, would deny that this is a fair statement of the facts. Mouth and lip, cervix uteri, skin—at least of face and hands—are now almost universally admitted to be a radiation field. Bladder and anus represent a more personal belief, and are perhaps open to debate. The value of really radical surgery as a second choice in the event of radiation failure must, however, be strongly emphasized in regard to the majority of these lesions.

TABLE VIII.—*Surgical Extirpation and Radiotherapy Both of Value. Often Combined, Surgery Dominant*

- Carcinoma of breast
- Secondary carcinoma in lymph nodes
- Carcinoma of body of uterus
- Carcinoma of vulva
- Carcinoma of penis and scrotum
- Carcinoma of the skin (of trunk and limbs, not face and hands)
- Benign giant-cell tumour of bone
- Mixed tumour of parotid

Lastly, in Table VIII is a series of lesions to which I have given the subtitle "surgery dominant," to indicate that in my opinion these lesions, if operable, must be so dealt with as the first plan of treatment. If they are inoperable, or if they recur, radiation has much to offer even as a curative agent, and in the later stages it remains of high palliative value. Moreover, even where surgery is used it is at times advisable that radiation be employed in conjunction with it. May I illustrate by considering two examples.

In breast carcinoma, where the case is clearly operable, operation is called for, but such operation has its value enhanced if combined with a radical course of pre- or post-operative irradiation. In contrast, the borderline operable case seems to have a greater chance of recovery if dealt with by irradiation first on an intensive basis, and only amputated if that should fail to produce response.

The common mixed-cell tumour of the parotid, although probably more correctly considered as a benign tumour, is another useful illustration. The well-recognized tendency for this lesion to recur after three or four years seems to be very appreciably checked by combining the excision with a radium implant or with radical post-operative *x*-ray therapy.

The Early Case

In conclusion I would like to refer to one aspect of the application of the recent Parliamentary Cancer Bill which perhaps merits some thought. We have seen that there are four cancer types which we can, even using the word in a very limited sense, call "curable"—namely, breast, mouth, uterus, and skin. While we hope that the proposed extension of therapeutic facilities which will undoubtedly be possible under the Cancer Bill may gradually open up greater prospects in all fields of malignant disease, there can be no doubt that for the present the main harvest will only be reaped in so far as the prognosis is bettered in these four lesions only. To my mind that harvest will be reaped only in part, and that in lesser part, through the provision of adequate treatment facilities. Probably more will depend on how far the schemes of education and propaganda which have been allowed for in the Cancer Bill do in fact bring these four diseases to treatment in their early stages. The salient feature about every one of them is that the diagnosis is easy once the question of possible malignancy is raised at all. The lesion can be *felt* or *seen*. In the first instance, therefore, it would seem to be worth while to concentrate effort very largely on two main and essentially simple items. First, we must try to get the public conscious, not so much of cancer as a whole, but merely that medical advice should be sought quickly for the very limited list of signs and symptoms represented by these diseases. Secondly, we must get the practitioner more conscious of the enormous value of early treatment and the consequent critical necessity,

where any doubt exists at all, of obtaining consultant opinion or of taking a section for histological examination. While admitting that the latter suggestion is controversial, I personally feel that much would be achieved by engendering the outlook that for the ulcerated lesion a section is as easy to get as a Wassermann test, and is of infinitely more value. Once such cases are diagnosed in their early stages, treatment becomes so important that they should be looked upon as urgent. Urgent treatment is particularly called for in early carcinoma of the breast.

Considering only the knowledge and the facilities at our disposal at the moment, greater immediate achievements are possible from the use of more simplified methods of education and propaganda for the early treatment of the accessible cancers, and by the organization of treatment facilities, than by any visible promise of accomplishment in the technique of treatment, whether by surgery or by irradiation.

Summary

This is an attempted analysis of the part which radiotherapy is capable of playing in the treatment of malignant disease. A survey is made of the various methods and technical facilities available, and how far they have been proved in practice to be effective or otherwise in treating each of the known types of malignant disease.

A classification of malignant disease in relation to treatability by radium is submitted.

The opinion is expressed that greater immediate achievements are possible from the use of more simplified methods of education and propaganda for the early treatment of accessible cancers, and by the organization of treatment facilities.

THE COMPLICATIONS OF GASTRIC ULCER

DESCRIPTION OF A CASE

BY

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It is unusual for more than two of the direct pathological complications of gastric ulcer to develop in one patient. The following case is of interest in that four complications were observed—namely, perforation, gross haemorrhage, pyloric stenosis, and carcinoma.

Case History

A mechanic aged 36 was first admitted to Walton Hospital, Liverpool, in February, 1936. Five hours previously he had felt a sudden violent pain in the epigastrium, and nausea but no vomiting. He gave no history of previous dyspepsia. On examination the whole of the abdominal wall was almost rigid, and there was pronounced tenderness to the left of the umbilicus. At operation a chronic ulcer was found on the anterior surface of the stomach near the middle of the lesser curvature, with a perforation in the centre. The perforation was repaired and covered with omentum and the abdomen closed with a pelvic drain. Apart from the development of a small patch of consolidation at the base of the left lung, convalescence was uneventful and the patient was discharged with instructions to report in two months' time.

He was admitted again five months later, complaining of epigastric pain after food and vomiting. The symptoms had begun two months after the operation. The fractional test meal showed a high acidity without delay in emptying of the stomach. The radiologist reported distortion of the pyloric antrum; the stomach wall was mobile, and no ulcer was seen; there was no evidence of carcinoma. The patient's condition improved with dietetic treatment, and he refused to undergo an exploratory operation.

One month later he was again admitted with a history of having vomited about two pints of red blood on the previous day. There was marked pallor. The red cell count was 1,625,000 and the haemoglobin content 25 per cent. There were two further haematemeses of about eight ounces each on the next two days, and he passed tarry stools for five days. After this his condition improved steadily. The fractional test meal now showed an abnormally low acidity with some delay in the disappearance of starch. The radiologist reported that there were multiple filling defects at the pyloric end of the stomach with some induration of the wall. A blood transfusion of 500 c.cm. was given. The patient was once more urged to submit to operation, but he again refused, and left hospital.

Admitted for the fourth time seven months later, he presented the appearance of advanced emaciation. He had been vomiting repeatedly for three weeks, and it became apparent during the next few days that very little food was passing through the pylorus. He was treated for ten days with gastric lavage and intravenous and rectal salines until it was possible to explore the abdomen under local anaesthesia. A huge indurated ulcer was found on the anterior wall of the pyloric antrum and some soft enlarged lymph glands in the vicinity. The naked-eye appearance of the ulcer did not suggest malignancy. A posterior gastro-enterostomy was done, but it was noted that a gastrectomy would have been better treatment had the patient's general condition allowed it. After this he gained weight steadily and was fairly well on discharge from hospital.

Fifteen months after the second operation he returned, complaining of vomiting of two weeks' duration. He was now pale and wasted, and a small hard mass was palpable in the epigastrium. A fractional test meal showed the characteristics of advanced carcinoma of the stomach, and the radiologist confirmed the diagnosis. The vomiting continued and a jejunostomy was done under local anaesthesia. The patient died two weeks later, two years and nine months after the first operation.

Necropsy.—A large saucer-shaped cancer was found surrounding the gastro-enterostomy opening, which barely admitted one finger. The growth had blocked the pylorus so that it was difficult to pass even a probe through it. There were no secondary deposits in the liver or in the other usual situations. The site of the cancer corresponded with the ulcer noted at the first and second operations, and presumably originated in it. Microscopical sections showed a columnar-celled cancer.

Discussion

The patient suffered from a gastric ulcer which was complicated successively by perforation, gross haemorrhage, pyloric stenosis, and carcinoma. It is difficult to state at what time the ulcer became malignant, but it is likely that the change had already occurred at the time of the second operation, which was done for pyloric stenosis. A gastrectomy performed three months after repair of the perforation would probably have resulted in a cure, but the patient's consent could not be obtained.

FREQUENCY OF THE COMPLICATIONS OF GASTRIC ULCER

The development of these four complications in one gastric ulcer must be a rare occurrence. Any estimate of the frequency of each of the various complications is affected by the fact that only a fraction of all patients with ulcer attend hospital, and almost all the available figures exclude the large ambulant group whose symptoms are never severe enough to demand hospital treatment.

Perforation.—A review of the literature shows that the estimated incidence of acute perforation among ulcer patients in hospital varies between 4 per cent. (Kruse, 1937) and 19.6 per cent. (Thompson, 1937). Eliason and Ebeling (1929) give 10 per cent., and Brown (1934) 11 per cent.

Haemorrhage.—The frequency of gross haemorrhage is given variously as 18 per cent. (Lahey, 1930), 20 to 25 per cent. (Gordon-Taylor, 1937), 28 per cent. (Kruse, 1937), 30 per cent. (Allen and Benedict, 1933), and 38 per cent. (Goldman, 1936).

Pyloric Stenosis.—The only reference I can find to the incidence of organic pyloric stenosis is that of Kruse, who gives a figure of 20 per cent., but mentions that 51 per cent. of peptic ulcers show some obstructive characteristics. Jordan and Kiefer (1934) report on seventy-nine cases in which a six-hour residue was found in the stomach on radiological examination. Only 11 per cent. of these patients required surgical treatment for relief of the obstruction, and it was assumed that in the remainder the obstruction was transient and due to inflammation, spasm, or oedema.

Carcinoma.—The literature on peptic ulcer abounds with discussions of the frequency with which carcinoma develops on chronic ulcer, and even now that the histological characteristics of ulcer-cancer have been described and generally accepted there is wide variation of opinion. Klein (1938) writes: "Malignant degeneration of chronic gastric ulcer, if it occurs at all, is rare." At the other extreme the astonishing figure of 68 per cent. has been attributed to Wilson and MacCarty, but the latter states (MacCarty, 1927) that it is impossible to determine the correct figure. Dible (1925), in a series of necropsy and operation specimens, estimated an incidence of 1.7 per cent. Gutmann (1935) gives 2 to 4 per cent., and his figures agree with those of Hauser (1926) (3.4 per cent.) and Newcomb (1932) (3.75 per cent.). Stewart's (1926) frequently quoted article gives 6.1 per cent., and from Gömöri's (1933) article a figure of 8.6 per cent. can be calculated. Most pathologists now agree that carcinoma is a rare complication of gastric ulcer, and I believe that this view is held by most surgeons, even if their choice of treatment is influenced by the possibility of malignant degeneration.

I am indebted to Dr. H. H. MacWilliam, medical superintendent of Walton Hospital, for permission to publish this case.

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USE OF STORED BLOOD FOR TRANSFUSION

AN INTERIM REPORT

BY

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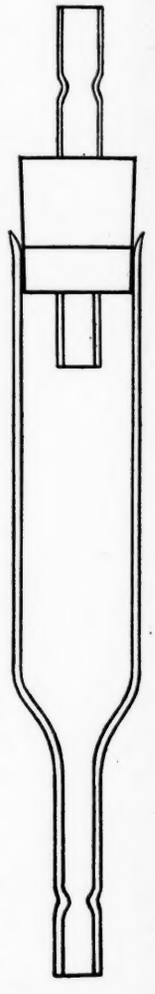
Group O blood was collected from the voluntary donors of the Emergency Blood Transfusion Service on September 3 and 4, 1939, for use in the event of air raid casualties. As these did not materialize it was decided to use the blood for patients already in hospital and requiring transfusion rather than waste it completely. To keep up the stock, relatives of these patients who belonged to Group O were bled when possible.

The apparatus used was that issued by the Medical Research Council and described in their publication, *Blood Transfusion Outfit*, September, 1939. The anticoagulant employed was pure sodium citrate. This was preferred to the citrate-saline mixture recommended, as in our experience less haemolysis of the stored blood resulted. At the time when the donors for the Emergency Transfusion Service were tested the samples were stored in this citrate-saline mixture (autoclaved in 1-oz. screw-topped bottles) and in many cases haemolysis was practically complete in forty-eight hours. With sodium citrate solution alone treated in the same way this did not occur.



Drip chamber

Method of Storage

Into each bottle 90 ml. (c.cm.) of 3.8 per cent. sodium citrate was put. When blood was added to the 540 ml. mark the final concentration of citrate was 0.63 per cent. The blood was collected straight into the bottle with a needle and a piece of rubber tubing about eight inches long. This was previously lubricated with sterile liquid paraffin. The double-bored cork was not fitted because when the bottle was agitated it disturbed the position of the needle unless a piece of tubing eighteen to twenty-four inches long was used. This was unsatisfactory, as the blood was more likely to clot, and the tubing was much more difficult to clean satisfactorily than the shorter piece. The mouth of the bottle was surrounded by a piece of sterile gauze. Latterly 20 ml. of a 50 per cent. sterile glucose solution has been introduced into the bottle with aseptic precautions. This gives an approximate final concentration of 2 per cent. glucose. The advantages of intravenous glucose in shocked patients is well known, and it also has some value in preventing haemolysis during storage. Spontaneous glycolysis does not occur at the temperature at which the blood is stored, as we have shown by daily sugar estimations over periods of ten days.

The blood was stored in ordinary household refrigerators of the size rented at 2s. 6d. a week, each one of

which held thirty-six bottles. The temperature was kept between 2° and 4° C. Two small 3 by 3/8 inch tubes were attached to the side of each bottle with adhesive tape. One contained clotted blood for the Wassermann reaction and the other a suspension of red cells in citrate for cross-matching with the recipient's serum.

When the blood was given, the official administering equipment B was used (glass-bead filter). The beads were added to the blood immediately before use. The only modification introduced was a drip chamber (see Fig.), made from 5/8 by 5 inch pyrex test tubes and glass tubing. This was inserted in the system two inches from the neck of the delivery bottle. If desired the delivery tubing can be filled with saline before puncturing the vein by removing the cork from the drip chamber. During the transfusion it was found that sometimes the weight of the blood in the delivery tube pulled the chamber off the cork. This can easily be prevented by binding the junction with a strip of adhesive tape. Occasionally it was found necessary to cut down on the vein and employ a glass cannula instead of the needle supplied. This whole apparatus has functioned very satisfactorily in practice.

TABLE I

	Date Blood Stored	Date Blood Given	Amount Given	Reaction	Haemoglobin Estimations
1. Male. Bleeding gastric ulcer ..	2/9/39	5/9/39	540 ml.	No reaction	5/9/39 40%
	2/9/39	8/9/39	540 ml.	,,	7/9/39 32%
					14/9/39 40%
					30/9/39 69%
2. Female. Ulcerative colitis	2/9/39	5/9/39	540 ml.	,,	5/9/39 58%
	2/9/39	9/9/39	540 ml.	,,	12/9/39 54%
	3/9/39	14/9/39	1,620 ml.	,,	15/9/39 80%
3. Female. Tuberculous empyema ..	2/9/39	7/9/39	540 ml.	,,	6/9/39 72%
4. Female. Threatened abortion ..	2/9/39	9/9/39	540 ml.	Temperature rose from 101.5° to 103.5° and then dropped to normal. Slight rigor half an hour after transfusion	8/9/39 32%
5. Female. Post-partum haemorrhage (breech delivery)	2/9/39	13/9/39	540 ml.	Temperature dropped from 99.8° before to 99° and 97.4° next morning. Pulse dropped also. Slight rigor half an hour after transfusion. No ill effects other than shivering	11/9/39 36% 15/9/39 36% 21/9/39 40% 2/10/39 48%
	3/9/39	23/9/39	540 ml.	Temperature rose from 98° to 100.2°. No increase in pulse rate. No further reaction	
6. Male. Haematemesis	3/9/39	15/9/39	540 ml.	No reaction	14/9/39 40%
	3/9/39	21/9/39	540 ml.	Temperature rose from 98° to 100.8° on same day and dropped to normal next day. Pulse rate went up to 158. No increase in respiration. No rigor or pain. Perspiration. Symptoms maximal half an hour after transfusion	19/9/39 48% 27/9/39 70% 3/10/39 80%
7. Male. Haematemesis	2/9/39	11/9/39	1,080 ml.	No reaction	11/9/39 50%
	3/9/39	15/9/39	540 ml.	,,	14/9/39 32%
	3/9/39	21/9/39	540 ml.	,,	19/9/39 40%
					26/9/39 58%
					6/10/39 52%
8. Female. Placenta praevia	3/9/39	16/9/39	540 ml.	,,	16/9/39 42%
	3/9/39	22/9/39	1,080 ml.	,,	26/9/39 66%
9. Female. Haematemesis and melaena	3/9/39	23/9/39	540 ml.	Temperature rose from 99° to 102.4° after half an hour. Pulse rate rose from 98 to 116. Some vomiting with the rise in temperature. No definite rigor. Slight yellowness of conjunctivae next day	22/9/39 42% 25/9/39 48% 28/9/39 48%
10. Female. Fibroids	4/9/39	25/9/39	540 ml.	Temperature rose to 102°, pulse to 112. No physical signs or symptoms	23/9/39 32% 26/9/39 38%
11. Female. Fibroids	3/9/39	19/9/39	1,080 ml.	No reaction	19/9/39 17%
	15/9/39	21/9/39	1,080 ml.	Temperature rose to 103°. Came down to normal after second lot (540 ml.) of blood. No further reaction	21/9/39 18% 22/9/39 36% 6/10/39 52%
12. Male. Aplastic anaemia	3/9/39	27/9/39	540 ml.	Temperature rose to 99.6°. Oxyhaemoglobinuria one hour after transfusion. Urine clear 48 hours afterwards	22/9/39 58% 29/9/39 68% 9/10/39 62%
	15/9/39	6/10/39	1,080 ml.	No reaction. Temperature remained normal. Pulse dropped from 132 to 104	
13. Female. Post-partum haemorrhage	3/9/39	29/9/39	540 ml.	No reaction	
14. Male. Ulcerative colitis	25/9/39	4/10/39	540 ml.	Slight rigor only	4/10/39 38%
	28/9/39	5/10/39	540 ml.	No reaction	5/10/39 27%
	23/9/39	6/10/39	1,080 ml.	,,	6/10/39 38%
					12/10/39 56%
15. Female. Abortion	4/9/39	4/10/39	540 ml.	,,	5/10/39 52%
	26/9/39	5/10/39	540 ml.	,,	6/10/39 36%
					12/10/39 44%
16. Male. Bleeding peptic ulcer ..	29/9/39	6/10/39	540 ml.	,,	7/10/39 70%
17. Male. Lung abscess	28/9/39	5/10/39	400 ml.	,,	3/10/39 32%
					9/10/39 60%
18. Male. Haematemesis	27/9/39	5/10/39	1,080 ml.	No reaction. Pulse dropped from 110 to 92 immediately	
19. Female. Post-partum haemorrhage	4/9/39	7/10/39	540 ml.	No reaction. Collapsed before. Pulse rapidly slowed to 90	12/10/39 46%
20. Female. Anaemia of pregnancy ..	26/9/39	9/10/39	540 ml.	No reaction	6/10/39 53%
					12/10/39 52%
21. Female. Septic abortion	26/9/39	9/10/39	540 ml.	,,	5/10/39 52%
					9/10/39 52%
					12/10/39 52%

Results of the Transfusion

Forty-six bottles of blood have been used. The blood had been stored three to thirty-three days, and the results are shown in Table I. Only in Case 12 was a moderately severe reaction encountered. Within an hour of starting the transfusion the child passed urine coloured a deep red and the temperature rose to 99.6°. On examination no red cells were found in the urine, and spectroscopic examination showed only bands of oxyhaemoglobin. The urine was normal next day and the child had no delayed reaction of any kind. In two cases (Nos. 3 and 4) in which the patients were febrile beforehand the temperature dropped to normal after the transfusion.

Alterations in the appearance of the blood during storage have been noted. The settled red cells turn almost black after three or four days and often a thick white layer of lipoid material settles out on the surface of the plasma. After the first week a layer of haemolysis, pink in colour, appears at the junction of the red cells and plasma. After twenty-eight days this may not be more than one inch deep and still only faintly pink. In some bottles, however, the whole of the supernatant plasma was similarly coloured. After thorough mixing, samples from the bottles were centrifuged. The amount of haemolysis was roughly proportional to the depth of the pink layer in the supernatant plasma, but was of course much more marked after shaking the settled blood. In practice we discarded all the bottles in which two-thirds of the supernatant plasma showed this pink tinge. Usually this pink layer was gelled and separated out in the filter. At no time did the blood show bacterial contamination.

The results of transfusion with stored blood are not so dramatic as with fresh blood. Often there is no immediate change in the patient's condition, and it may be two days before a maximal clinical improvement is noted. Similarly in exsanguinated patients rapid stimulation of blood formation is the exception rather than the rule. Haemoglobin estimations (Haldane) before and after transfusion are shown in Table I.

TABLE II

Length of Storage in Days	No. of Bottles Given	Reaction
3	2	Nil
5	1	Nil
6	3	1 and 2: Rise in temperature 3: Nil
7	5	1: Slight rigor 2, 3, and 4: Nil 5: Nil
8	2	Nil
9	4	1: Slight rigor 2, 3, and 4: Nil
10	1	Nil
11	4	1: Slight rigor 2, 3, and 4: Nil
12	2	Nil
13	4	Nil
16	2	Nil
18	2	1: Slight rise in temperature 2: Nil
19	2	Nil
20	2	Both showed rise in temperature and increased pulse rate
21	4	1: Slight rise in temperature 2, 3, and 4: Nil
22	3	1: Nil 2 and 3: Oxyhaemoglobinuria
26	1	Nil
30	1	Nil
33	1	Nil

Summary

When used for transfusion the blood had been kept for varying times (from three to thirty-three days). No really severe reactions were encountered. In one case there was a transient oxyhaemoglobinuria. In other cases there was a slight rise of temperature and pulse rate, and twice the patients had very mild rigors.

Comparison between the length of storage and reaction produced is shown in Table II. Blood given during the first six days of storage produced no reaction, and thereafter the length of time of storage has no effect in increasing the number of reactions encountered. Dramatic improvement in the clinical condition of the patient is much less frequent than when fresh blood is used. Blood regeneration is also slower.

My thanks are due to the medical officers of Redhill County Hospital for their willing co-operation in giving the transfusions and recording clinical data.

Clinical Memoranda

Paratyphoid B Fever with Respiratory Involvement

Early involvement of the respiratory system in enteric fever has been recognized for many years (Vincent and Muratet, 1917; Osler and Macrae, 1925). These cases give rise to considerable diagnostic difficulties, particularly in the early stages of the disease, the true clinical condition usually becoming apparent when other systemic manifestations of enteric fever appear. The following case of paratyphoid B fever is reported because clinical and radiological evidence of lung involvement remained the most striking feature throughout the whole duration of the illness.

CASE REPORT

A man, aged 29 was admitted to a general hospital on October 17, 1938, complaining of headache, generalized pains, and a troublesome cough. At the age of 7 he had had a right empyema thoracis treated by rib resection, since when he had been subject to winter attacks of bronchitis. The present illness was considered to be of this nature until the sixth day after admission, when persistence of an irregular pyrexia and a slight degree of splenic enlargement indicated further investigation. Leucocytosis (58,000) with a slight relative lymphocytosis was present, the blood culture was sterile, but specific agglutinins to *B. paratyphosus* B were present in a serum dilution of 1 in 40 (O) and 1 in 180 (H).

The patient was transferred to the Eastern Hospital on October 26. On admission he was rational but fairly ill, and showed both dyspnoea and orthopnoea. Cough was a very troublesome feature and was accompanied by abundant frothy sputum. There was no impairment of lung resonance, but large rales were present at both bases. Examination otherwise revealed slight tumidity of the abdomen, a palpable splenic edge, and complete absence of abdominal reflexes. The bowels were constipated.

On October 28 the patient complained of pain at the angle of the left scapula, which was aggravated by coughing. Some

impairment of resonance was present over this area and was accompanied by a rough pleural friction sound. Radiological examination showed irregular masses of opaque shadows in both lung fields, suggesting pneumonic patches, possibly based on the interlobar fissures. One well-marked area was present in the left lower lobe. The abdomen was now normal in appearance, but the splenic edge could still be palpated. The bowels remained constipated, but paratyphoid B organisms were recovered from the faeces. Blood examination showed a rising titre of specific agglutination to 1 in 80 (O) and 1 in 640 (H).

On November 3 the patient was more toxic and ill. He presented all the features of an acute pneumonic condition with dyspnoea, pleural pain, and a frequent troublesome cough. Sputum was still fairly abundant, but examination on this and other occasions failed to reveal paratyphoid organisms. From this point the patient began to improve. The temperature fell by lysis on the tenth day after admission and subsequent progress was quite uneventful. Radiological examination five weeks after admission showed a complete disappearance of lung shadows.

The resemblance of this type of paratyphoid infection to a purely respiratory disease has already been described by many writers (Stolkind, 1916; Klein and Torrey, 1920; Maxwell, 1937). In the above case the resemblance was so close as to carry a grave risk of delayed recognition, to the danger of other patients in a general hospital ward. The points of clinical value in differential diagnosis would appear to be: toxaemia out of proportion to physical signs in the lungs; splenic enlargement; and absent abdominal reflexes. It has been noted in previous epidemics that a preponderance of respiratory forms has characterized an enteric outbreak, as if the individual strain of organism had a predilection for the respiratory system. Support for this view cannot be gained from the present case, since one of the nursing staff contracted the disease, the illness being of the usual type and quite devoid of any respiratory features.

I am indebted to Dr. N. D. Begg, superintendent of the Eastern Hospital, for permission to publish the details of this case.

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A Large Calculus of the Urethra

The following case is, I think, worth recording on account of the comparative rarity of such large stones in this region.

Case History

A man aged 66 was admitted to the Royal Infirmary, Sheffield, on March 25, 1937.

History.—In 1918 while running to a "dug-out" in France he fell on to a piece of wood which struck him in the perineum. There was immediately intense pain at the site of injury and along the penis, and later he noticed a few drops of blood at the end of the urethra. He did not pay any particular notice to this, as there was no difficulty in passing water. He did not report the accident and received no treatment. About three years later he began to suffer from difficulty in passing water. This slowly and progressively became worse, and as time went on he noticed that the stream of urine was becoming gradually thinner. A year before his admission to hospital he found that there was a lump in the perineum. It felt as hard as a bone, and was the size and shape of his thumb. He then found that he was able to alter the character of the stream of his urine by manipulating the lump, and concluded that the thin stream was due to the lump. For a year there had been considerable frequency of micturition. Otherwise he has always had good health.

Examination.—The patient looked well and healthy. On inspection of the perineum a swelling, measuring about 1 by 2 inches, was seen in the middle line immediately behind the scrotum. On palpation it felt hard and almost subcutaneous. It was movable in a transverse direction and was not tender. A diagnosis of a stone in the bulbous urethra was made and was confirmed radiologically. On micturition the stream was seen to be very thin and its character could be altered by manipulation of the stone. Examination of the urine showed pus, the infecting organisms being *B. coli* and a streptococcus. Radiological examination of the rest of the urinary tract did not reveal any other calculus, and the excretion pyelography was normal.

Treatment.—An external urethrotomy was performed and the stone was easily removed from a pouch in the bulbous urethra. The wound was stitched in layers and a soft rubber urethral catheter tied into the bladder. Recovery was uneventful.

Post-operative Course.—The frequency of micturition disappeared gradually during the course of a year. The stream of urine is now normal. The urethra admits a No. 12 catheter, and a urethrograph, taken about nine months after operation, shows the urethral pouch still present but about a third of its original size.

The Stone.—This measured 7/8 inch by 2¼ inches. Its colour was grey and its surface was smooth. On section it was laminated, and in its centre was a pale brown nucleus or

primary stone which was also laminated. On chemical analysis the outer and larger portion gave the reactions for calcium and magnesium phosphate and the core or nucleus gave the reaction for calcium oxalate only.

Commentary

It is evident that the patient sustained a traumatic rupture of the urethra in 1918. This was followed by the development of a stricture of the urethra which would have been symptomless but for the fact that it blocked the downward passage of a single primary oxalate stone. The secondary phosphatic deposit on the primary stone seems to have taken place over a period of fifteen years and to have given rise to comparatively few symptoms until the occurrence of acute cystitis.

I am deeply grateful to Professor Ernest Finch for allowing me to treat and publish this case.

T. M. J. d'Offay, F.R.C.S.
The Royal Infirmary, Sheffield.

Reviews

BRITISH ENCYCLOPAEDIA OF MEDICINE

The British Encyclopaedia of Medical Practice, including Medicine, Surgery, Obstetrics, Gynaecology, and Other Special Subjects. Vol. XII, Tetanus to Yellow Fever. Under the general editorship of Sir Humphry Rolleston, Bt., G.C.V.O., K.C.B., M.D. (Pp. 672; index 56; 48 figures; 12 plates, some of which are coloured. 35s. net.) London: Butterworth and Co. 1939.

Volume XII of the new British Encyclopaedia completes the first series. It is to be followed by supplementary volumes containing, first, the index for the whole and certain new information which has come to hand since the first printing, and, secondly, a series of abstracts of medical literature and critical surveys of the development of the special branches. The complete index will be welcome as the present index to each volume is little more than a synopsis of contents. The continuation of the admirable series of articles under the able editorship of Sir Humphry Rolleston and his colleagues will be looked forward to with interest, and it is to be hoped that the war will not lead to a reduction of the high standard of scholarship, accuracy, and production hitherto maintained.

The longest article in the present volume deals with toxicology in its widest aspects. Poisoning, whether for homocidal or suicidal purposes, or accidental, is described by Dr. Roche Lynch of the Home Office, and the subject of industrial poisoning, a branch of medicine of great importance in which already much effective work in prevention has been carried out, by Dr. Donald Hunter. The practitioner will find in these concise and clear descriptions of symptoms and appearances the methods of dealing with such cases in their clinical and medico-legal aspects. The other long contribution is that on diseases and disorders of the uterus; in this four expert gynaecologists deal with its developmental abnormalities, displacements, prolapse, and tumours. One of the most satisfactory sections of the whole encyclopaedia has been that dealing with obstetrics and the diseases of women. The general practitioner has in this series clear and useful instruction in this important branch of his work. In this volume there are in addition sections on affections of the female urethra and on diseases of the vulva and vagina.

The consulting editor in tropical diseases, Sir Leonard Rogers, gives a survey of the incidence of general diseases in tropical countries based mainly on his own data from the analysis of a large number of necropsies on medical cases in Calcutta. It is interesting to note, and these figures are similar to those returned from the Philippines and in tropical America, that only one-third of the total deaths were due to tropical diseases in the strict sense, and even these are predominantly cholera, the dysenteries, and kala-azar. Tuberculosis and respiratory diseases are commoner among tropical patients, circulatory diseases considerably less, than at home. Articles on trypanosomiasis, yellow fever, torulosis, and tropical ulcer are included in this volume. The typhus fevers and trench fever are dealt with by Major-General Sir John Megaw. Both of these are regarded as due to Rickettsia infection carried by human parasites, especially lice, and therefore are liable to occur in widespread epidemics in conditions of overcrowding and defective hygiene, such as may be found during the war. Dr. Izod Bennett gives a useful summary of symptoms and treatment of uraemia, Dr. Dorothy Russell discusses the broad aspects of tumour formation in its effects on the functions of the body, and Dr. L. J. Harris describes present-day knowledge of the vitamins.

ENDOCRINOLOGY

The Endocrine Glands. By Max A. Goldzieher, M.D. (Pp. 916; 271 figures; 42s.) New York and London: D. Appleton-Century Company, 1939.

Professor Max Goldzieher's book on the endocrine glands is the product of thirty years' personal experience. He aims at stressing treatment based on that experience and protests against the nihilistic attitude which has found this startlingly frank expression, "No sound clinician is enthusiastic about therapy."

Large volumes on endocrinology follow one another with such rapidity that a reviewer can best help the prospective reader by calling attention to some individual features in each rather than by an analysis of the contents that would inevitably consist largely of repetition, since in the main they all follow the same plan. In the book before us more attention than usual is paid to the association between the endocrines and the vegetative nervous system, though perhaps greater stress is laid on the clear-cut distinction drawn by Eppinger and Hess between vagotonia and sympathicotonia than is usually current today. The importance is emphasized of receptor factors in the tissues in conditioning the response to hormonal stimulation, an aspect of the subject which is steadily attracting increasing attention. The short sections on the part played by endocrines in regeneration, ageing, and rejuvenation contain some interesting suggestions—one can hardly put it higher than that. Among these we may mention the alleged influence of thyroid in facilitating the formation of those areas of regeneration which may occur in cirrhosis of the liver.

Perhaps one of the more novel topics discussed is the influence of the endocrines on the reticulo-endothelial system. It was originally pointed out by Donath and Saxl (1925) that changes in the functional activity in the cells of this system could be observed following the injection of pituitrin or adrenaline. Later observers have claimed that these changes increased the resistance of experimental animals against infection. The author obtained some more direct evidence by injecting dyes, iron salts, and cholesterol, which are stored in the reticulo-endothelial system, and then observing the effects of hormones in increasing or decreasing the amount thus stored. He also employed an endogenous indicator such as bilirubin. As reticulo-endothelial cells are scattered throughout the various tissues and organs of the body they could not act similarly or synchronously unless they were regulated by a superior physiological force. As these cells do not possess nervous connexions they must be dependent upon hormonal influences, which from these observations he concludes are endocrinal. Alterations in the storage of fats and cholesterol in certain pathological conditions he thinks can be explained along similar lines. He attributes a considerable influence in this process to the adrenal cortex, but does not state clearly the evidence on which that opinion is based. We are more favourably impressed with his views on the effect of the pituitary on water storage in the reticulo-endothelial system, for it is clear that in many cases of so-called "pituitary obesity" retention of water plays a large part; salyrgan, which influences the water balance in the tissues, will not infrequently reduce weight more effectively than any organotherapy.

Professor Goldzieher's account of hypothyroid leanness is certainly rather heterodox, and the clinical description

of two illustrative cases is not full enough to convince us. It is true, as he says, that pituitary insufficiency may lead on the one hand to obesity and on the other to the atrophy of Simmonds's disease; but the parallel is not really exact, since the pituitary secretes several hormones, while the thyroid only gives rise to one. Loss of weight accompanied by a low basal metabolic rate occurs in various conditions, and the presence of tachycardia in his cases hardly suggests that hypothyroidism was the cause. However, in such a rapidly growing subject as endocrinology there must, and indeed should be, room for different views and opinions. Apart from occasional rather startling statements Professor Goldzieher's book, which is well arranged and well illustrated, will prove a useful work of reference.

ALLERGY

Practice of Allergy. By Warren T. Vaughan, M.D. (Pp. 1082; 338 illus. 50s. net.) London: Henry Kimpton. 1939.

Nominally the third edition of a work by the author, this very large volume is really a new book which differs from its two predecessors in its title and other respects; the issues in 1930 and 1934 of *Allergy and Applied Immunology* were intended for both the medical profession and patients, whereas the present work is addressed to practitioners alone, the patients being provided for in the companion volume *Primer of Allergy*. The whole subject of allergy is exhaustively reviewed: its history, going back to "the father of medicine" and Lucretius, its physiology, aetiology, mechanism and significance, skin testing, elimination diet, percutaneous or diadermal allergy, and serum sickness. These sections form a storehouse of information, and lead up to the last of the sixteen parts of the volume—namely, that dealing with allergic diseases.

In addition to asthma (the term "bronchial asthma" being discarded), hay fever, migraine, skin diseases, and gastro-intestinal disorders, the manifestations, or at least the possible relations to allergy of a number of other diseases, such as thrombo-angiitis obliterans, angina pectoris, arthritis, gout, essential hypertension, and congenital pyloric stenosis, which are not usually included among the group of allergic diseases, are passed in review. Cases justifying this discussion are given—for example, great reduction of high arterial blood pressure as a result of the adoption of a diet free from articles to which the patient was shown to be sensitive. The subjects of thrombo-angiitis obliterans have been found to be sensitive to extract of tobacco in a high proportion. In three cases of angina pectoris, watched for long periods, the author reported considerable improvement, though not cure, by a diet freed from foods to which the patients were sensitive. In the eightieth and last chapter, which lays stress on the need for continuous records of life, a well-deserved tribute is paid to Sir James Mackenzie for the establishment of the St. Andrews Institute for Clinical Research in 1918.

CONSCIOUS ORIENTATION

Conscious Orientation: A Study of Personality Types in relation to Neurosis and Psychosis. By Dr. J. H. van der Hoop. Translated by Laura Hutton, B.A., M.R.C.S., L.R.C.P. (Pp. 352; illustrated. 15s. net.) London: Kegan Paul, Trench, Trubner and Company. 1939.

This book is not for the general reader. The author started as a disciple of Jung and proceeded to an analysis by Freud, and has since sought to discover the common ground between them by an intensive study of their philosophies and methods. He has always been attracted by Jung's attempts to differentiate types, especially the differentiations in relation to conscious orientation—thinking, feeling, intuition, and sensation. After a discussion of the nature and interrelationship of these types he discusses them in reference to the development and outlook of various psychopathic types, particularly in connexion with the psychoneuroses. So far as the psychoses are concerned he correlates his own ideas in typology with Kretchmer's distinction of people into cyclothymics and schizothymics, criticizing Kretchmer as too vague and with too great a tendency to mix pathological with normal manifestations. Finally a philosophical commentary is added, with a concluding chapter on the influence of the personal equation of an author not only on his formulation of types but on his whole approach to psychopathology.

This is not a book which is easily read, but the specialist who can spare the time and give the necessary concentration to the study of Professor van der Hoop's thesis will find himself enriched by the exercise.

DUODENAL DISORDERS

Affections non Ulcéreuses du Duodénum: Duodénites, Diverticules, Stases Mécaniques et Fonctionelles, Tumeurs, Malformations, Parasites. Physiologie Normale et Pathologique, Thérapeutic. By I. Pavel and A. Paunesco-Podeano. Preface by J. Ch. Roux. (Pp. 204; 57 figures; 50 fr.) Paris: Masson et Cie. 1938.

While ulceration of the duodenum is the commonest and most important pathological condition of that organ, there are a number of affections less well known. These have been dealt with simply and yet satisfactorily in the book by Drs. Pavel and Paunesco-Podeano of Bucarest. Just as gastritis has come into clinical prominence again, so duodenitis is now an established condition recognizable by *x* rays. It is, of course, frequently associated with duodenal ulcer, but in many cases there are reticular strial relief pictures of the duodenal mucous membrane with absence of a niche suggestive of ulcer, and an abnormal irritability of the duodenal bulb which is small and shows variable but considerable deformity. As well as this pseudo-ulcerous form, the authors describe duodenitis of haemorrhagic type, usually associated with disease of the gall-bladder or appendix, and duodenitis with jaundice. One of the latter forms is the so-called catarrhal jaundice, but in others there is a chronic state with prolonged jaundice in which at necropsy there is a greater or less degree of hepatitis forming one of the subgroups of Hanot's cirrhosis. Duodenal stasis may be mechanical from scars in the duodenal wall, or pressure from inflammatory processes externally in the gall-bladder region, or from compression by the pedicle of the small bowel mesentery, especially in defective abdominal muscle tone following operation, pregnancy, or illness. Tumours of the duodenum are rare, but parasitic infestation with lamblia and hookworm is fairly often met with. The former may give rise to symptoms in the duodenum and may invade the gall-bladder. Since the perfection of *x*-ray technique the frequency of duodenal diverticula has been reflected in the large number of papers in the medical journals, and while some of these diverticula are without symptoms, others cause patients to have more or less discomfort, vomiting, haematemesis or melaena, while inflammation of the wall of the diverticulum may occur and involve neighbouring organs.

The book is well put together. It begins with a summary of existing knowledge of the physiology of the duodenum, contains a number of useful illustrations and a fairly complete bibliography, and will be well received in a library of reference.

Notes on Books

In *The Restoration of the Peasantries* (C. W. Daniel Company Ltd., 6s.) Dr. G. T. WRENCH traces the history of the Indian peasantry. His thesis, which was implicit in his earlier work, *The Wheel of Health*, is that the primary function of the land should be to produce food—not profit. He shows how in India, as elsewhere, chemical impoverishment and physical erosion have followed failure to return to the soil everything which has taken life from it and have brought in their train much avoidable poverty and other evils. Dr. Wrench presents many sobering facts and poses several urgent questions. Some of these questions he leaves unanswered, to others his answer is clear: only by the restoration of the peasantries of the world to healthy functioning will a healthy soil be resurrected and maintained and the health of plants, beasts, and man be assured.

Mr. F. A. PHILBRICK has produced a textbook *Inorganic Chemistry* (G. Bell and Sons, 6s.) in which a radical departure is made from the plan of such works hitherto produced. The underlying idea of this departure is the fact that textbooks have hitherto had a tendency to overburden the reader with more or less disconnected chemical facts to the detriment of his grasp of principles. The idea has a sound basis. If, as some may think, Philbrick has only in part accomplished his purpose he has yet done a good work in breaking through tradition; the break is overdue. And if he has carried his principle to too great a length for the elementary student, his book will, none the less, have a value as an additional textbook for supplementary reading which can hardly be overestimated. It is fully informative over a wide range of chemical knowledge.

Applications Médicales du Nouveau Codex et Prescription des Substances Vénéneuses, by Professor RENÉ HAZARD of Paris, gives an account of the changes that have appeared in the French Codex of 1938. These changes are very numerous, because the previous Codex appeared in 1908, and in the intervening thirty years several supplements have been published. The volume also gives an account of the French poison laws, which are based on an Act of 1916, as modified by several subsequent Acts and regulations. These laws bear a general resemblance to those in force in this country. There are separate schedules for poisons, for stupefying drugs, and for drugs which may only be supplied on a medical prescription. The volume provides a brief summary of the essential facts relating to the prescribing of drugs under French law. The publishers are Masson et Cie, and the price 18 fr.

L'Examen du Malade: Guide Clinique de l'Étudiant et du Médecin, by P. Delmas, G. Giraud, E. Jeanbrau, E. Leenhardt, J. Margarot, P. Pagès, V. Riche, L. Rimbaud, J. Terracol, and H. Villard, is published in a revised and enlarged edition by Masson et Cie of Paris at 45 fr. This concise handbook with fifteen chapters but without illustrations describes how to examine patients, including the case history, and covers the wide field of medicine, surgery, obstetrics, gynaecology, neurology, and other special departments. M. Émile Jeanbrau, professor of clinical urology, and eight colleagues of the medical faculty of Montpellier have dedicated this second edition of their combined pens to M. E. Leenhardt, professor of paediatrics, who died while the handbook was in the press. Since the first edition in 1935, not only has the text been revised but two new chapters have been added: psychiatric disorders by Professor Paul Pagès and endocrine manifestations by M. G. Giraud, professor of clinical medicine, who contributes two other important chapters on the general medical examination and most of the laboratory methods. Professor Jeanbrau, with thirty years' experience in teaching, is responsible for the examination of surgical patients and two chapters on examination of the urine—the "living" urine in the clinic and that in the laboratory. Well arranged, this handy volume is provided with a good index.

Preparations and Appliances

A DROP-WRIST SPLINT

Mr. J. S. KELLETT SMITH, F.R.C.S., D.M.R.E. (Cheltenham), writes:

Drop-wrist occurred in some 14 per cent. of cases of injury to peripheral nerves sent for treatment to the electrotherapy and massage department of Summerdown Camp in the four years 1916–20. Splinting was a problem at first. The ordinary small "cock-up" is dirty and uncomfortable in wear, and expensive in the way of plaster and bandages. While in charge of the above department I designed a drop-wrist splint which proved a success in practice. Our own supply was made by an enthusiastic amateur who possessed a suitable workshop, and the pattern was copied afterwards in many other centres. The splint consists of a length of rigid tinned steel wire, gauge 8 or a little heavier, on which is threaded a wooden finger rest and some rubber tubing as padding for the thumb. The wire is then bent to appropriate shape for "rights" and "lefts," and the ends turned forwards to form a pair of loops. A second pair of loops of finer wire is soldered into position as shown. Finally, a piece of inch-wide stout webbing is fixed between the terminal loops. The splint is held in position by two lengths of similar webbing passing through the retaining loops and fastening with book-strap buckles (Figs. 1 and 2).

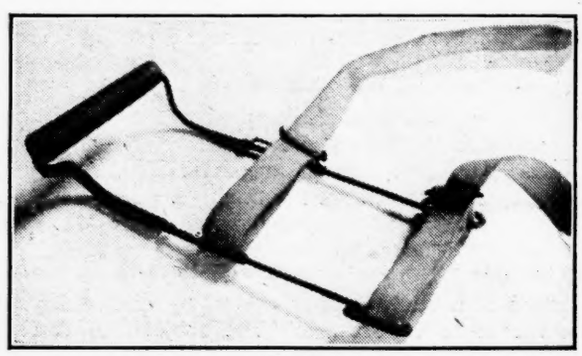

FIG. 1.

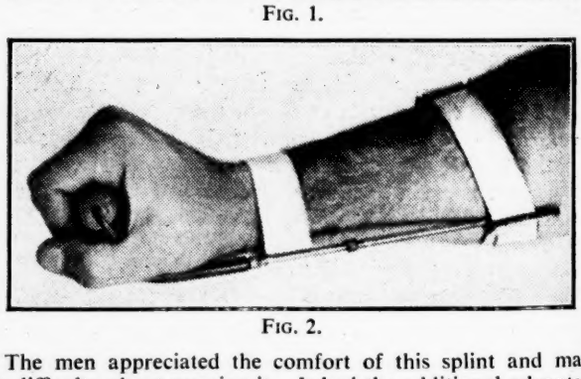

FIG. 2.

The men appreciated the comfort of this splint and made no difficulty about wearing it. It had the additional advantage of costing nothing for bandages.

On October 21 (p. 810) we noticed the polyvalent vitamin concentrate made by H. R. Napp Ltd. under the name "abecedin." In regard to the keeping properties we are asked to say that the warning given by the manufacturers to users of this product as to the possibility of deterioration by air contact after the packet has been opened applies only to the emulsion and not to the tablets, which are sugar-coated.

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DRUG TREATMENT OF ANGINA AND HYPERPIESIA

In 1933 Evans and Hoyle[1] showed that drugs were of little help in the continuous treatment of angina pectoris, though they later[2] pointed out that glyceryl trinitrate tablets were of great value in the prevention and treatment of individual attacks, provided they were chewed thoroughly to ensure rapid therapeutic action from immediate absorption of the drug from the mouth. Their conclusion as to the inefficacy of continuous drug treatment in diminishing the frequency or severity of attacks of angina pectoris has been completely confirmed by Master, Jaffe, and Dack.[3] They studied the effect of sixteen drugs, including several xanthine derivatives; alcohol; sedatives such as phenobarbitone, chloral, and bromides; the nitrites; a tissue extract; digitalis; and two narcotics—codeine and dilaudid. No remedy was found to exert any specific effect on the anginal syndrome, for the best effects were obtained with a placebo and the number of patients improved ranged between 15 and 30 per cent. for all drugs. "A new medication, a new physician, a new type of therapy may bring relief. Thus the average patient feels improved during the first few weeks of attendance at the clinic no matter what drug he receives. This probably explains the reports of good results with numerous drugs." A large volume of recent work has proved that the psychological factor is as important in effort angina as in migraine or asthma. It is probable that effort angina occasionally occurs when coronary disease is absent or minimal, and it is certain that effort angina associated with extreme coronary sclerosis may be completely relieved by the removal of emotional stresses such as friction in the home or the work-place and financial insecurity. It is on such factors and not on drugs that the therapeusis of angina pectoris should be concentrated.

Continuing the process of pharmacological deflation, Evans and Loughnan[4] have completed an investigation of the action of thirty-three preparations on the blood pressure and symptoms in seventy patients with hyperpiesia (essential hypertension) over a period of eighteen months. The drugs or preparations were various and included nitrites, iodides, sedatives, xanthine and choline derivatives, vegetable extracts, and hormones. The first important fact which these observations reaffirmed was the great extent of the spontaneous variations in blood pressure. There is commonly an initial fall due to the excitement and novelty of the first estimation, and thereafter quite considerable cyclic variations in the pressure may occur. There seems to be little or no correlation between these fluctuations in the pressure and the symptoms. After allowance had been made for the tendency to obtain high blood-pressure readings at the first and possibly at the second examinations and for the natural variation, and when the results from the tested drugs had been compared with those from a placebo, Evans and Loughnan found that none of the thirty-three preparations produced hypotensive effects in patients with hyperpiesia. In regard to symptomatic improvement only six of the drugs—namely, bismuth subnitrate, iodine and iodide, bromide, sodium luminal, theominal, and potassium thiocyanate—on an average relieved symptoms rather more than did the placebo. The sedative drugs seem to be of use in temporarily relieving nervous symptoms when these are prominent. Reduction of weight in patients with obesity was usually associated with relief of symptoms, but the variations in pressure did not differ from those in the untreated disease.

Whether patients with hypertension would be benefited by a sustained fall in their pressure produced artificially, as it were, and in ignorance of the cause of the condition, is a moot point, for at present there is no medical or surgical means by which this may be done. There are three arguments against the use of drugs in uncomplicated hypertension. First, they are ineffective. Secondly, many are expensive; treatment with padutin can be estimated to cost 5s. 6d. a week, and a three-weeks course of treatment with vagotonine would cost two to four pounds. Thirdly, they may do harm. The only positive effect Evans and Loughnan observed with vagotonine was a severe urticaria. Moreover, a large literature has grown up about thiocyanate therapy in hypertension, which leads to the conclusions that thiocyanates in doses large enough to reduce blood pressure are toxic and may destroy life, and that in some patients there is little or no margin of safety between the toxic and the therapeutically effective dose.[5]

[1] *Quart. J. Med.*, 1933, **26**, 311.
[2] Ibid., 1934, **27**, 105.
[3] *Amer. J. med. Sci.*, 1939, **197**, 774.
[4] *Brit. Heart J.*, 1939, **1**, 199.

GAS INJURIES TO THE EYE

Fifty-two years ago Leber[6] in a study on inflammation in the eye described the action on the cornea and conjunctiva of a highly irritating chemical compound just discovered by his colleague Viktor Meyer. To Leber, who noted fully the destructive action of this new compound, the point of interest was that it could produce pyogenic inflammation in the absence of micro-organisms, but he lived to see his new laboratory

[5] *J. Amer. med. Ass.*, 1939, **112**, 1220.
[6] *Die Enstehung der Entzündung*, Leipzig, 1891, p. 338.

reagent used for less academic purposes. His conclusion that mustard gas could produce a pyogenic reaction was advanced only tentatively, for it was based on a single experiment on a rabbit, and his expressed wish for the experiment to be extended and amplified has since been carried out on a larger scale than he dreamt of and in the grimmest of laboratories. As a footnote to Leber's experiments it may be stated that the German High Command in 1915 fully confirmed his observations on the necrotizing action of this compound, but disproved that it induces a pyogenic reaction in the absence of secondary infection. A conclusion of Viktor Meyer's was also disproved, for it was found that, contrary to his belief, the action of mustard gas was strictly local and not remote from absorption through the blood stream.

The fundamental feature of ocular injuries produced by mustard gas is that the injury is directly proportional to the concentration that reaches the eye. During the last war, when vapour gas was used and the methods of distribution were not too effective, only about 10 per cent. of gassed men developed corneal lesions—mostly transient—and it is said that only about fifteen men in all were blinded by gas. The methods of distributing gas that are available to-day are likely to cause more casualties (in the absence of protective measures, which have also grown in effectiveness). The latent period between exposure and the appearance of symptoms, which in the last war was generally six to twelve hours, is thus likely to approach the total absence of a latent period after a splash from liquid gas, and the severity of the reaction is likely to be such that many more cases of corneal involvement, with their much longer course and more serious prognosis, will be seen. In the improved protective measures rather than in improved methods of treatment lies the hope of counteracting these threatening possibilities, for treatment of a gas injury, whether brought about by vapour or by liquid, comes up against the fundamental difficulty that the effect of gas on a tissue is instantaneous, though there is some experimental evidence that the prophylactic use of chlorinating agents will render a gas injury to the eye less serious.[7]

The potentialities of gas warfare have been increased not only by the perfection of the means of distributing more concentrated vapour but also by its possible use in air raids on the civil population. This possibility was usefully discussed in the Section of Ophthalmology at the Aberdeen Meeting of the British Medical Association this year. The discussion revealed that there were considerable gaps in our knowledge of the action of gas on the eye, and that the measures of defence left room for improvement. One of the openers, Colonel A. Irvine-Fortescue,[8] stressed the need for hospital facilities of the marquee type to accommodate a sudden large influx of persons temporarily blinded by gas. It is true that most such patients have no serious lesions, but the irritating symptoms and the anxiety state which develop make in-patient treatment necessary. Patients with no serious lesions, yet unable to open their eyes and afraid of blindness, may well be a source of panic when treated as out-patients. An auxiliary nursing personnel specially trained in eye irrigation and a sufficient supply of irrigators to allow of a considerable number of eye casualties being treated simultaneously are other measures necessary to supplement this improvised in-patient treatment. That such facilities are at present not widely available emphasizes Colonel Irvine-Fortescue's plea for a special civilian ophthalmic corps working under the supervision of an ophthalmologist-in-chief. Besides unresolved administrative problems there were many others of a clinical character, as was brought out by Mr. Arnold Sorsby[9] at the same meeting. Mustard gas being persistent and its action instantaneous, the scope for treatment appears to be distinctly limited. Yet irrigation has some value by minimizing the possibility of a cumulative action. The variety of suggested methods of treatment indicates only too clearly the prevailing confusion. Some would use bland lotions to effect mechanical cleansing; others see virtue in alkaline lotions. Drops of castor oil or paraffin have their advocates, though the wisdom of introducing into the eye substances which act as solvents of mustard gas is doubtful. The weight of opinion is against the use of cocaine or its substitutes to relieve symptoms, as it is generally agreed that cocaine is undesirable because of its devitalizing effect on the corneal epithelium. The employment of atropine in cases of corneal involvement is the one positive feature on which there is agreement. Silver preparations to counteract possible secondary infection, though generally recommended, are condemned by some.[7] The use of ointments as suggested by a correspondent[10] in last week's *Journal* is open to serious objection, while his advocacy of keeping the eyes bandaged is contrary to experience and theoretical considerations. There is indeed nothing to be said for any method of treatment which impedes free secretion of the irritating products of a gas burn and tends to keep the gas pent up in the eye. Bonnefon's[11] recommendation of procedures, such as irrigation by hypertonic lotions, which aim at an increased flow of secretion is physiologically more sound.

The lack of agreement of views extends even to the question of gas-masks. One difficulty is the reduced field of vision induced by eye-pieces in some of the more elaborate masks. The wearing of glasses with most forms of mask is uncomfortable, apart from

[7] *The Medical Aspects of Mustard Gas Poisoning*, London, 1919, p. 123. By A. S. Warthin and C. V. Weller.
[8] *British Medical Journal*, 1939, **2**, 846.
[9] *British Medical Journal*, 1939, **2**, 641.
[10] Ibid., 881.
[11] *Gaz. hebd. Sci. méd.*, 1939, **60**, 168; *Siècle méd.*, 1939, September 1.

rendering the masks ineffective from disturbed fitting. Specially made spectacle frames of reduced size and white metal do not overcome the disadvantage of moisture settling on the lenses, for the spectacles tend to disturb any anti-dimming substances applied to the lenses or eye-pieces of the mask. From a careful survey of various possible devices for the individual compelled to wear glasses with his mask, Cot, Moynier, Genaud, and Robert[12] conclude that the best procedure is the incorporation into the gas-mask of two separate wire rims each carrying a lens. This arrangement is easily fitted into the standard gas-mask used in France, but would not appear to be suitable for the corresponding model in this country.

POTASSIUM IN THERAPEUTICS

The clinical scientist, perusing perhaps for the first time that admirable volume the *National Health Insurance Formulary*, may notice with interest the extent to which potassium salts enter into popular therapeutics, and he cannot fail to be surprised to learn that the total amount used medicinally runs into hundreds of tons a year. Much of this is in the form of the bromide and is a relic of the days when the corresponding sodium salt was difficult to prepare in a pure form. Sodium and ammonium bromide have nowadays certain theoretical advantages over the potassium salt and may well replace it if necessary. In other prescriptions potassium salts are used merely for what the pharmacologist calls a salt action, and this is the use which may most seriously be questioned. An average diet contains from 3 to 4 grammes of potash and 5 to 8 grammes of soda a day. Sodium chloride deficiency is quite common, but potassium deficiency appears to be unknown. Anyone who has treated a case of Addison's disease by means of a low potassium diet knows how difficult it is to reduce the intake of potassium. The only conditions in which the action of the potassium ion appears to be of value are the rare nervous diseases familial periodic paralysis[13] and myasthenia gravis.[14] Large doses of potassium salts have also been recommended in asthma and other allergic diseases,[15 16] but here their value is much more problematical. Until recently the oedema of Bright's disease was an accepted indication for potassium salts, but evidence has now accumulated to show that they may be very dangerous when the kidney is diseased. At the meeting of the Association of Physicians of Great Britain and Ireland last year[17] several speakers described how patients with oedematous nephritis often died suddenly and unexpectedly, and they attributed this to the use of potassium salts as a diuretic, with consequent retention of the depressant potassium ion in the body fluids. Thomson[18] has shown this graphically by serial electrocardiograms in patients with nephritis to whom potassium salts were given in high dosage. There seems little doubt about the risk of sudden cardiac death if the level of potassium in the body fluids rises much above the normal levels. The term "diuretic" is sometimes used in other senses than the relief of dropsy, and potassium salts are prescribed as diuretics and diaphoretics in febrile illnesses. The prescription of saline solutions for such a purpose is not a very rational procedure. A moment's thought shows that the only way to get water out of a dehydrated patient is to put water in, and fluids must be pushed by mouth, by rectum, or in the last resort intravenously, until the tongue becomes moist and the output of urine rises to 1,500 c.cm. a day. Potassium salts are likely to do more harm than good under such conditions, and, if salts must be prescribed, they should be salts of sodium. A febrile urine means no more—and no less—than a failure on the part of the attendants to meet the increased requirement of fluid when the temperature is high. Finally, alkaline potassium salts are given in urinary diseases such as pyelitis, cystitis, and urethritis, but here the action is sedative rather than diuretic and the therapeutic agent is the alkali and not the potassium. There is no reason why sodium citrate should not be used for alkalinization. A pleasant way of administering it is to dissolve three-quarters to one teaspoonful in a nearly full glass of cool water and add slowly the juice of half a large lemon or one lime.[19] We understand there is no actual shortage of potassium salts, but the physician wishing to reduce his drug bill, whether in private or panel practice, might more often pause and ask himself, "Do I really wish to prescribe potassium?"

[12] *Presse méd.*, 1939, **47**, 1311.
[13] Aitken, R. S., Allott, E. N., Castleden, L. I. M., and Walker, M. (1937). *Clinical Science*, **3**, 47.
[14] Laurent, L. P. E., and Walther, W. W. (1935). *Lancet*, **1**, 1434.
[15] Rusk, H. A., Weichselbaum, T. E., and Somogyi, M. (1939). *J. Amer. med. Ass.*, **112**, 2395.
[16] Bloom, B. (1939). Ibid., **113**, 1507.
[17] Platt, R. (1938). *Quart. J. Med.*, **31**, 590.
[18] Thomson, W. A. R. (1939). *Lancet*, **1**, 808.

THE LONDON AMBULANCE SERVICE AND ITS CRITICS

The London ambulance service normally consists of twenty-two stations and 173 vehicles. To this has been added a volunteer ambulance service, formed for the transport of injured persons to first-aid posts and hospitals, which comprises some 200 stations, most of them, of course, buildings designed for quite other uses, an unstated number of vehicles of various sorts, and a staff of about 8,000 volunteers, among whom men and women are in about equal proportions. Although the service is described as "volunteer," the majority of the workers are paid for their services. Various criticisms have been directed against the service; they are not as pointed as those which concern the A.R.P. services in general, but it is complained that the service is not sufficiently co-ordinated with the other precautionary services, that it overlaps in some directions and leaves lacunae in others, and that there is a lack of sufficiently strict central control, leading to a certain absence of discipline in the rank and file. One detailed criticism is that the ambulance stations and the stations of the A.R.P. stretcher parties do not correspond, but as to this it is pointed out that

[19] Solis-Cohen, S., and Githens, T. S. (1928). *Pharmacotherapeutics*, New York and London.

the stretcher party stations are much more numerous than the ambulance stations, and, moreover, that the stretcher parties, after placing their casualty cases in the ambulance, may be called elsewhere to render first aid, so that there is still good reason for keeping the two services separate and under different directions. It is not quite clear how many volunteers have been enlisted for stretcher party work ; the Home Office originally called for 14,000, who would be trained to qualify for first-aid certificates under the borough councils and their medical officers of health. A quota was given to each of the London boroughs, and it is understood that some of them have not yet secured a full enrolment.

On inquiry at the offices of the London County Council we were informed that those responsible for the ambulance service preferred to say nothing at the moment in view of the fact that a report on the subject is to be presented to the next meeting of the Council, fixed for November 14. Some of the criticisms are easily answered by the fact that the service is a new one and has to pass through the inevitable period of "growing pains." Its expansion has been very rapid, and it would be rather wonderful if the recruitment of personnel or material had been everything to be desired. Within the first three weeks of war 5,000 volunteers had been enlisted and over 100 stations opened, and within eight weeks the number of stations had been doubled and the number of volunteers increased by more than half. It is out of the question to suppose that 8,000 people joining an emergency service can immediately be disciplined in the same way as a regular ambulance service, each member of which has been carefully chosen and has undergone a long period of training. The people who have joined the service belong to all classes of the community, from titled ladies accustomed to driving their own cars to young men whose only experience has been on commercial lorries. The vehicles taken over for ambulance purposes are also of very diverse character ; many of them are ordinary delivery vans fitted with racks to carry stretcher cases. A good deal of weeding out of both volunteers and vehicles has had to take place, and as time goes on there is every likelihood that the service will be as efficient as it is reasonable to expect, always bearing in mind that it is an auxiliary service, a temporary one, and to some extent voluntary. In any case criticism should be stayed until the London County Council has made its reply.

A WORLD ASSESSMENT OF BLINDNESS

The International Association for the Prevention of Blindness undertook in the past years an inquiry into the incidence of blindness throughout the many countries of the world, and of the regulations in force in those countries for the prevention of blindness. This report has now been published in French by the Egyptian "Concilium Ophthalmologicum."[1] It is an important piece of work of 310 pages, and full of information collected by the International Association. No fewer than thirty-seven countries responded to the inquiry. It is of much interest to compare the reports and to note the differences shown in them, not only in the variation in the main causes of blindness but also in the number of the blind in relation to the populations. In the East the figures are estimates, and they are high owing mostly to the widespread incidence of trachoma. In some of the Western countries the figures seem to be contradictory, for there is recorded a higher proportion of blindness in some of those countries where we know most is done, and done successfully, for the prevention of blindness. The reason for that apparent contradiction is that in these countries, like England, blindness is measured by its economic disability and not by a total absence of sight. The report is a valuable document and the Egyptian publication is well done.

[1] *Rapport de l'Association Internationale de Prophylaxie de la Cécité sur le Nombre des Aveugles et la Protection des Yeux dans les Différent Pays.* Vol. VII. Cairo: E. and R. Schindler.

CIRCULATION IN THE FOETUS

While continuing their radiological studies of the ductus arteriosus[1] with a greatly improved technical equipment, A. E. Barclay, Sir Joseph Barcroft, D. H. Barron, and K. J. Franklin were led to suspect their previous identification of this structure in the sheep foetus. They have now shown that this suspicion was justified, for in their latest paper[2] they present conclusive evidence from three distinct types of experiment. The most spectacular experiment was the retrograde injection of radio-opaque medium, via the femoral artery, in a newborn lamb with a very feeble heart-beat. The medium, faced by so low a resistance, passed up the aorta to the aortic valve and from the aorta, through the ductus arteriosus, into the pulmonary trunk and pulmonary arteries. Individual frames from the direct *x*-ray cinematographic record of the injection show quite clearly the anatomical relations of the ductus to the two great vessels that it unites. It is to be noted that the ductus joins the aorta distal to the point of origin of the brachio-cephalic artery, which corresponds to the innominate and the left subclavian arteries of the human subject. Having identified the ductus beyond dispute, the authors of the paper proceeded to investigate the courses taken by the blood flowing along the superior vena cava, and from the umbilical vein along the inferior vena cava. They found that all the superior caval blood goes into the right ventricle ; thence it passes, on the one hand, into the pulmonary arterial system and, on the other, through the ductus arteriosus into the descending aorta. In contradistinction to the superior caval flow the oxygenated blood coming up the inferior vena cava from the placenta has two pathways. The bulk of it goes through the foramen ovale to the left side of the heart and passes via the aortic valve into the aorta, whence it supplies, through the coronary arteries, the heart, and through the brachio-cephalic artery the brain. At the same time a small portion leaves the main stream in the right auricle and goes through the right ventricle to the pulmonary arterial system and, by way of the ductus arteriosus, to the descending aorta. The experiments described provide the first direct demonstration of the mammalian

[1] *British Medical Journal*, 1939, 1, 929.
[2] *Brit. J. Radiol.*, 1939, 12, 505.

foetal circulation, and it is of interest to see how closely previous observers have approached to the actual facts by various indirect methods. The times taken for functional closure of the ductus arteriosus and foramen ovale are not given in detail, but may be expected to appear in a later paper. It is not without interest that this description of the foetal circulation and identification of the ductus arteriosus has been published in the same year as the first successful ligation of a patent ductus in the human being.[3]

"FOREIGN PHARMACEUTICAL PRODUCTS: BRITISH EQUIVALENTS AND ALTERNATIVES"

In last week's *Journal* (pp. 868–75) we published under this heading a list of pharmaceutical preparations described as "foreign products," with an attempted correlation of British products. As indicated in the introductory paragraphs, the schedules were furnished to us by the Association of British Chemical Manufacturers, upon whom we relied for their accuracy. We have now received communications from a number of firms in this country informing us that certain of their pharmaceutical products are included in the list erroneously as "foreign products," whereas these products are manufactured in this country and in some instances have been so for a number of years. Sulfarsenol Laboratories, Ltd., for example, state that sulfarsenol is now manufactured in England at Alperton, Middlesex. The Denver Chemical Manufacturing Co. (London, N.W.9) state that for years past antiphlogistine has been made in England, and they do not anticipate any shortage. Warner and Co., Ltd., of Power Road, Chiswick, London, W.4, the proprietors of the trade marks "anusol" and "veganin," inform us that these products have been manufactured by them in England for a number of years. Gedeon Richter (Great Britain) Limited state that their products aurobin and kalmopyrin are manufactured by them in London. Ciba Limited state that dial tablets have been manufactured in this country for over twenty years, that they have ample stocks of coramine, and that the manufacture of this product will shortly begin in their new laboratories at Horsham. Laboratory Nativelle Ltd. (London, N.1) state that there is no shortage of stocks of Nativelle digitaline, and they have taken elaborate precautions both in France and in this country to ensure continuation of supplies. It should be pointed out that the introduction to the schedules published last week did not state that any or all of the products listed in columns 2 and 4 are necessarily equal in value to the products listed in column 1. The explanatory note reads as follows: "Column 2 gives the British product/s having the same essential composition as the item in column 1. Column 4 gives the British product/s having similar therapeutic properties and capable of replacing the product in column 1." No statement was made that any of the products in column 1 are unobtainable in this country. The mistake—in which we followed the Association of British Chemical Manufacturers—was in heading column 1 "Foreign Product," and including under that heading a number of proprietary preparations which, though understood to be of foreign origin, are manufactured in this country. In the list supplied to us the names of certain trade marks are set out as if they were the names of drugs. It has been pointed out to us that in doing so we may have infringed the rights of the owners of the trade marks under the Trade Marks Act of 1938. We can only express our regret for having inadvertently published material which may infringe a trade mark or which is incorrect or in any way misleading. Our purpose in printing the list supplied to us was to make information available to medical men concerning the British sources of supply in case they should experience difficulty in obtaining proprietaries of foreign origin which they had been accustomed to use.

CHRONIC ARTHRITIS AND GONORRHOEA

Acute gonorrhoeal arthritis is not uncommon and is recognized by its association with a recent acute infection, but gonorrhoea is easily overlooked as the possible cause of chronic progressive arthritis. Dr. R. J. Weissenbach and his colleagues[1] found that out of 1,485 cases of chronic rheumatic diseases 126 were gonorrhoeal in origin. In some of these cases the original infection had occurred many years earlier, and there had been acute or subacute attacks of arthritis or arthralgia before the chronic condition developed. One joint only was affected in thirty-three of these authors' cases, and more than three joints in seventy-one. The knees were most often attacked and then the feet, while in the upper limb the wrists were the most usual site of the disease. The old idea that the sterno-clavicular and temporo-maxillary articulations are especially liable to attack receives no support from these authors, who state that in no circumstances should symptoms in these joints be regarded as a guide in diagnosis. They attach importance, however, to the localization of the arthritis in the feet and ankles and especially to pain in the heel, and regard gonorrhoea as the principal cause of pain in this region and of the spurs or exostoses sometimes seen on the os calcis. A tendency to bony ankylosis, which they think especially liable to affect the knee and shoulder, is regarded by them as characteristic of gonorrhoeal infections, though others find bony ankylosis of the tarsus more common. Weissenbach and his colleagues emphasize the association of iritis with arthritis of the vertebral column, but it should be noted that irido-cyclitis has been reported in cases of ankylosing spondylitis without evidence of gonorrhoeal infection. Treatment with sulphonamide compounds was successful in five out of seven of the cases of acute gonorrhoeal arthritis. Out of thirty-seven subacute cases the disease was cured in nine and arrested in twenty-six, and out of three cases of the chronic form it was cured in two and arrested in one. These figures show that the treatment is worth trying in proved or suspected cases of gonorrhoeal arthritis.

[3] *J. Amer. med. Ass.*, 1939, **112**, 729.

[1] *Rev. Médecine*, 1939, **56**, No. 4.

SURGICAL PROCEDURES IN GENERAL PRACTICE

The series of articles under this heading, now resumed, was interrupted in April of this year to make room for a special series on War Wounds and Air Raid Casualties, concluded in our last issue.

FRACTURES OF THE NECK OF THE FEMUR

BY

PHILIP WILES, M.S., F.R.C.S.

Fractures of the neck of the femur are divided into two groups—intracapsular fractures of the neck proper and fractures involving the trochanters. Extracapsular fractures through the base of the neck belong, from a practical point of view, to the trochanteric group. The two groups are widely different as regards both prognosis and treatment.

Intracapsular Fractures

These fractures are seen principally in the elderly, although they may occur at any age. The blood supply of the neck of the femur is never very good, and with advancing years there are often porotic changes that seriously weaken the structure of the bone; it is then liable to fracture with minimum trauma. The fracture is usually close to the head, but it may be at an intermediate position in the neck. A common history is for the patient to trip and fall when walking about the house—there is no need for any more serious accident. The actual fracture may even occur before the patient falls, as from the jar of stubbing the toes; the fall is then the result of the fracture, not the cause of it.

Signs and Symptoms

The fractures are classified into two groups—adduction and abduction. The distinction is of importance, because the former are never impacted, whereas the latter usually are; the prognosis and treatment are therefore entirely different.

Adduction fractures (Fig. 1, left) comprise at least three-quarters of the total number. There is a great deal of pain, and the patient is often left lying where he has fallen until the doctor arrives. The typical position of the leg is one of adduction and external rotation; the latter may be so marked that the outer border of the foot is lying flat on the floor. There is shortening of the limb, which is partly apparent, due to the adduction, and partly real. Real shortening is caused by upward displacement of the main fragment and may amount to anything between one-half and three inches. There is tenderness on pressure over the great trochanter and in Scarpa's triangle, and pain on jarring the heel. Active movements are impossible and passive movements painful.

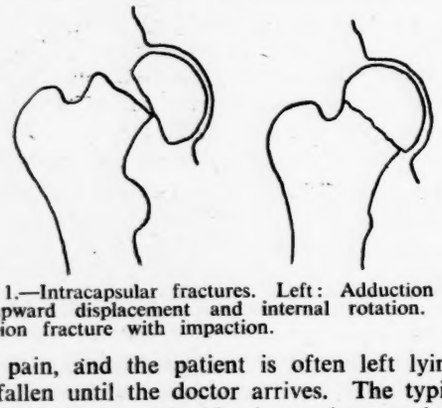

FIG. 1.—Intracapsular fractures. Left: Adduction fracture with upward displacement and internal rotation. Right: Abduction fracture with impaction.

Abduction fractures (Fig. 1, right) occur in about one-quarter of the cases. The pain is much less severe, and it is not at all uncommon for the patient to be able to get up, and even to bear weight, immediately after the fall. As there is almost always impaction of the fragments the limb does not assume the classical position described above. It usually lies with the foot straight or internally rotated, and the real shortening is not more than one inch. There is some pain and tenderness in the inguinal region. Active and passive movements may be possible over a limited range without causing very severe pain. Passive movements must, however, be examined with care for fear of disimpacting the fragments, and for the same reason no attempt must be made to elicit crepitus.

Diagnosis

The diagnosis in a classical case is immediately apparent from the history and the position of the limb. However, when there is not much displacement of the fragments, or when they are impacted, it may be difficult to be certain of the nature of the injury. It is unwise to move the patient too much for the purpose of making elaborate measurements of the bony landmarks because of the danger of causing further displacement. Nor should the patient be told to "try the leg out and see how you get on." Radiological examination must be made in every case in which there is the slightest element of doubt—that is, where an elderly person has had a fall causing pain in the hip. The interpretation of the radiographs may be difficult when the fracture is impacted; therefore films of good quality and in both antero-posterior and lateral planes are required. If first-class portable equipment is not available the patient should be sent to hospital by ambulance. To overlook the fracture may be a major tragedy for which the doctor might possibly be held responsible.

Prognosis

Impacted abduction fractures seldom give much trouble, but an adduction fracture is one of the most serious accidents that can befall an elderly person. In the past it was associated with a very high mortality, and even under modern conditions the death rate is higher than that in most other simple fractures. The patient is often already debilitated, there is some shock, the pain is severe and prevents the patient sitting up, and death ensues from pulmonary and cardiac complications. The risk is greatly diminished if the fracture is reduced at the earliest possible moment, so that he can sit up and move about a little without pain. If the patient survives—and at least 90 per cent. should do so—the prospect as regards the ultimate restoration of function is good. In the great majority of cases it is possible to obtain sound bony union by operative methods.

Treatment

Abduction Fractures.—The fragments are impacted and no attempt should ever be made to improve the position. The principal indication is to avoid disimpaction and ensure that no weight is carried on the leg until there is firm union. Many people have walked with these fractures from the start without coming to any harm, but they are

taking a serious risk. The patient is put to bed without any retentive apparatus. Some movement is possible, and he can be propped up at once in the Fowler position to reduce the risk of pulmonary trouble. There is, however, no need to keep him in this position all the time; he can lie down at night, and it is an advantage for him to turn on to the sound side. Later he can be lifted into an arm-chair and taken out of doors in a wheel-chair. After ten to fourteen days the pain diminishes greatly and active movements are begun. Local massage assists in getting rid of any bruising, and general massage is helpful in maintaining the patient's condition. After six weeks a weight-bearing calliper is fitted; it is worn for about eight weeks, until the radiographs show good consolidation of the fracture. The earlier use of a calliper entails more risk because of the difficulty in ensuring that it carries the weight properly. The instrument is hard to fit, especially in fat people. The best type has a "bucket top" in place of the more usual ring; it is made of moulded leather, and laces in front to allow of easy adjustment. The bucket fits under the ischial tuberosity, from which the weight is transmitted down the side bars of the instrument in the shoe. The heel should not touch the shoe, and it carries no weight at all. It is advisable to check personally the fitting of a calliper. This can be done by slipping a finger into the patient's shoe under his heel; he should then be able to transfer his whole weight to the calliper without hurting the finger.

Adduction Fractures.—Treatment cannot be undertaken in a private house unless there is adequate provision of trained nurses and equipment. The great majority have to be transferred to hospital; the sooner this can be done the better the prognosis. Moving the patient on to a stretcher and carrying him downstairs may cause a great deal of pain. Attempts at splinting of any sort are nearly as painful, and are best omitted. The most satisfactory procedure is to give an intravenous anaesthetic, which should last long enough for the patient's transfer to the ambulance; it can, if necessary, be repeated during the journey.

SMITH-PETERSEN NAIL

Nearly every other form of treatment has been superseded by the use of the Smith-Petersen triradiate nail. The operation has a greater significance than setting a fracture usually implies; it is a life-saving measure. Once the fracture is fixed, the patient is free from pain, is able to move and to sit up, and the dangers of prolonged immobilization are removed. It is not a particularly dangerous procedure; there is little operative shock, and age alone is not a contraindication. The operative mortality is so low that it can safely be said that the chance of survival of any but a moribund case is greater with operation than without it.

The methods of introducing a Smith-Petersen nail and individual variations in technique are so numerous that description of detail is of little value. In general, the procedure can be divided into two stages: first, reducing the fracture; secondly, introducing the nail. Reduction at open operation is now almost universally abandoned in favoured of "closed" methods. Some surgeons perform the reduction by manipulation on the operating table immediately before inserting the nail. Others do it by traction while the patient is still in bed. The limb is placed in a Thomas splint suspended from a Balkan beam, and traction is applied by a weight (10 to 15 lb.) attached by adhesive strapping. The reduction is controlled by radiographs, and when the position is satisfactory the nail is inserted without removing the extension.

After-treatment also varies greatly with the surgeon. It is, however, becoming more widely appreciated that weight-bearing before consolidation of the fracture is unsafe—too many cases have occurred in which the pin has broken or become displaced. My own practice is to keep the patient in bed for six weeks. After two weeks, massage is begun and active movements of flexion and extension of the hip are encouraged, but rotation is avoided because the leverage may be great enough to dislodge the nail. It is advisable to wear in bed a shoe with a twelve-inch ruler fixed transversely to the heel to prevent external rotation by the weight of the limb. After six weeks the patient is allowed up in a weight-bearing calliper, which is worn until there is satisfactory radiographic evidence of consolidation. The pin may have to be removed at a later date, but it is not essential to do so unless it starts to extrude itself.

OTHER METHODS

Other methods of treatment may be required in the rare case in which the patient is unfit for operation or in which operation is refused. The choice then lies between fixing the limb in a long plaster-of-Paris spica extending from toes to nipple line (Whitman) and continuous weight traction as used for trochanteric fractures. In both cases radiographic control of reduction is essential. A successful result may be expected in 40 to 50 per cent. of cases.

Ununited Fractures

Non-union may be encountered when operative treatment has been impossible or has been neglected, or when displacement has recurred after operation. A satisfactory functional result is often obtained by osteotomy (McMurray). The femur is divided obliquely below the great trochanter and the distal fragment displaced inwards below the head. A plaster-of-Paris spica is applied and kept on for about three months, by which time union between all three fragments should have occurred. If operation is impossible there is no alternative to the permanent use of a weight-bearing calliper.

TROCHANTERIC FRACTURES

These fractures may occur at any age, but more usually in middle age or later, as the result of direct violence applied to the great trochanter or a rotation strain, or both together. There are two main types: (1) Fractures through the base of the neck or obliquely through the adjacent part of the great trochanter. The lesser trochanter may also be detached. The displacement is seldom pronounced, but there may be external rotation which opens up the gap between the fragments (Fig. 2, left and centre). (2) Comminuted fractures in which the neck seems to have been driven through the great trochanter. There is usually considerable displacement and marked coxa vara (Fig. 2, right).

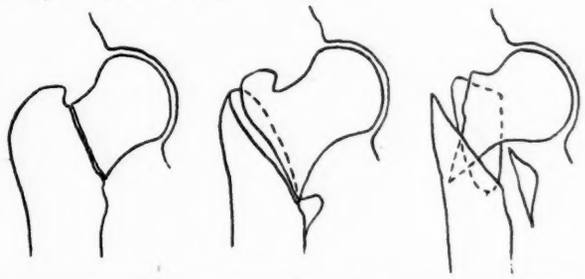

FIG. 2.—Trochanteric fractures. Left: Type 1, fracture through base of neck, without displacement. Centre: Type 1, fracture through great trochanter, with external rotation and detachment of lesser trochanter. Right: Type 2, comminuted fracture.

Diagnosis

On examination there is pain and tenderness over the great trochanter, but the pain tends to be less severe than with intracapsular fractures. There may be external rotation of the limb, and in the second type there is real shortening. The diagnosis is made on radiological examination. Either stereoscopic films or a lateral view is advisable, because in fat people the great trochanter may have fallen into a plane posterior to the neck and yet appear to be perfectly positioned in a flat antero-posterior film.

Treatment

TYPE 1

If there is excessive rotation the displacement is reduced under anaesthesia. Internal rotation is the only movement required; care must be taken not to exert too much traction or to abduct widely, or coxa valga may result. The reduction is controlled radiologically, and then a plaster-of-Paris spica is applied. For the application of the plaster the patient is placed on an orthopaedic table or, if that is not available, on a pelvic rest. In the latter case the shoulders are raised on a platform to the height of the pelvis in order to prevent lordosis. The feet are held by two assistants with the legs slightly abducted and flexed at the hips; about 10 degrees of flexion and eighteen inches separation of the feet are sufficient. The affected hip is kept in internal rotation and the knee of that side flexed 45 degrees. The line joining the antero-superior spines must be perpendicular to the median plane of the body. The bony points are well padded with felt, or the whole area to be included in the plaster may be covered with a layer of wool secured by a cotton bandage. A well-fitting plaster is then applied, extending from the costal margin to the tips of the toes. The sound leg is not included. The plaster must be worn for at least twelve weeks. If weight-bearing is started too soon the neck of the femur may bend at the site of fracture, causing coxa vara. An active patient may be able to get about on crutches after the first week or two.

An alternative method of treatment is the insertion of a short (2½ to 3 inch) Smith-Petersen nail. The operation is easy in experienced hands and does not require any elaborate control of direction. The hip is then protected by a short plaster spica stopping above the knee, and weight-bearing may be begun after a few days. The plaster should not be discarded for about eight weeks.

TYPE 2

The fracture requires reduction because of the varus deformity. The most satisfactory method is by continuous skeletal traction. A Smith-Petersen nail cannot be used because of the comminution. Traction is conveniently applied by means of a Kirschner's wire through the femur; the leg rests in a counterbalanced Thomas splint in a position of full abduction and internal rotation.

The leg is first placed on a Thomas splint of a suitable size; the ring should be large enough not to cause pressure and yet not so large as to get in the way. Strips of flannel bandage four inches wide are folded round the bars and beneath the leg and secured by large safety-pins or paper clips to the outer bar. The splint is then suspended from a Balkan beam, preferably by four cords, one from each corner of the splint. The cords are passed round pulleys and carried to the head of the bed, and weights are attached to counterbalance the weight of the limb. Loose shot in canisters provide a convenient method of varying the weight, which is so adjusted that when the patient moves—for example, to sit up or to use the bed-pan—the splint and limb move with him without effort. The foot is supported at right angles by a foot-piece attached to the splint or by a strip of adhesive plaster on the sole leading to another cord ending in a 1-lb. weight. The foot of the bed is placed on nine-inch blocks so that the patient's weight will provide countertraction.

When the splint is in position a Kirschner's wire is inserted. This can be done under local anaesthesia: an area about one inch in diameter on each side of the leg is freely infiltrated with novocain down to and including the periosteum. The wire is inserted well clear of the knee-joint and its suprapatellar pouch—that is, about two inches above the adductor tubercle. The stirrup is applied and the wire strained as tightly as possible to prevent bending; it should give a very high-pitched note when struck. The cord for traction is attached to the stirrup and passed over a pulley on the lower upright of the Balkan beam.

It is advisable to start traction with a considerable weight, say 25 to 30 lb., so that reduction is effected rapidly. Radiographs are taken after twenty-four hours, and if the position is satisfactory the weight is reduced to 10 lb. A heavy weight must not be used for long without *x*-ray control or it will produce coxa valga. The fragment consisting of the lesser trochanter does not return to its proper position; it joins by fibrous union and does not cause any subsequent trouble. After a week a knee-flexion iron is attached to the Thomas splint in such a position that the hinges are in the plane of the knee-joint. The flannel strips are transferred to this iron and another cord and weight are provided to counterbalance it. Movements of the knee are made at least once daily under supervision; it is possible to obtain, with assistance, at least 90 degrees of flexion. Traction is maintained for twelve weeks or until firm consolidation is shown radiologically—if the weight is removed too soon the varus deformity is liable to recur. With a heavy patient it is advisable to use a weight-bearing calliper for another six to eight weeks.

TUBERCULOSIS IN WAR TIME

DEPUTATION TO MINISTER OF HEALTH

The Minister of Health, Dr. Walter Elliot, on October 27 outlined to a deputation representing the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council, and the Tuberculosis Association, at which representatives of the Society of Medical Officers of Health and the London County Council were also present, the steps which had been taken to ensure that tuberculous persons continue to receive treatment while keeping an adequate reserve of beds for air raid casualties.

War-time Accommodation

Dr. Elliot said he was having the greatest difficulty in persuading people that hospital services were available now just as before the outbreak of war. In particular it had always been intended that the anti-tuberculosis services should be maintained in war time. Although some patients had been discharged from sanatoria and other institutions to allow of accommodation for casualties, about two-thirds of the 28,000 beds provided for the treatment of tuberculosis in England and Wales remained available throughout the early weeks of the war for their peace-time purpose, though naturally this proportion varied in different parts of the country. If through some misunderstanding actively infectious cases had been discharged they should be sought out and brought back for treatment.

An instruction issued on October 4 had specially emphasized the importance of the tuberculosis services. A long-term policy was particularly desirable in this field. Steps had been taken to remove any misunderstanding which might have led to the refusal of residential treatment to tuberculous patients in need of it, and also to enable a substantial number of smaller tuberculosis institutions originally included in the casualty scheme to return wholly to their normal functions. This had made available some 5,000 more beds. In addition, as more and more of the hutted annexes to hospitals were completed, so more and more beds at present allotted to casualties would be released.

Other services were also returning to normal. In London, for example, the dispensary services, after an initial lull and difficulties owing to the temporary transfer of personnel, were resuming almost pre-war activity. In some reception areas these services had, indeed, been expanded. He would welcome arrangements between local authorities in any region whereby the accommodation in their various districts might be pooled to enable hospitals to be assigned wholly to casualty or tuberculosis work, and thus avoid, where possible, the mixing of tuberculous and non-tuberculous patients. One such arrangement is already in force in the West Riding of Yorkshire.

The Minister welcomed the efforts of the organizations represented to promote action along these lines. He assured them that the importance of maintaining facilities for the surgical treatment of both pulmonary and non-pulmonary tuberculosis was fully recognized. He was also fully alive to the need for making satisfactory arrangements for the treatment of tuberculous patients in the Army, Navy, and Air Force. This question was at the moment under consideration with the Services.

The Minister welcomed particularly this opportunity of discussing the problem frankly with the representatives of all the different sides of the tuberculosis services. He suggested that they should appoint a small liaison committee which could report to him how the instructions so far given were being carried out and how the steps taken were working in practice. He promised also to consider carefully the other representations of the organizations.

Those who attended the meeting with the Minister were:

Representing the National Association for the Prevention of Tuberculosis, the Joint Tuberculosis Council, and the Tuberculosis Association.—Sir Percival H.-S. Hartley, Sir Henry Gauvain, Dr. R. A. Young, Professor Lyle Cummins, Dr. G. Lissant Cox, Dr. G. B. Dixon, Mr. H. Arthur Baker, Councillor R. W. Brosch, Dr. S. Vere Pearson, Dr. J. B. McDougall, Dr. G. T. Hebert, Dr. Lloyd Rusby, Mr. J. E. H. Roberts, and Dr. J. H. Harley Williams.

Representing the Society of Medical Officers of Health.—Dr. P. L. T. Bennett and Dr. James Ferguson.

Representing the London County Council.—Dr. W. Allen Daley and Dr. A. M. Hewat.

WAR-TIME RADIOLOGY

The British Institute of Radiology, although it has abandoned for the time being its monthly sessional meetings, is continuing its principal functions; its office door is still open in Welbeck Street, the regular issue of its journal is being maintained, and instruction is given under its auspices for the D.M.R.E. Major D. B. McGrigor, the new president of the Institute, on being inducted into the chair at a meeting on October 19, said that it was hoped during the winter, if circumstances permitted, to have a one- or two-day meeting at which the two annual memorial lectures—the Mackenzie Davidson and the Silvanus Thompson—together with the Skinner Lecture of the Faculty of Radiology, might be delivered, but the usual conference held in December, with its attendant exhibition, has had to be abandoned. Many of the members of the Institute are on service at home or overseas, and Major McGrigor gave a word of advice to young radiologists going or expecting to go abroad. He said it appeared necessary to remind young radiologists not to expect in their new environment the ready-to-hand conditions of work to which they were accustomed in the civil hospitals and laboratories at home, where the turn of a tap or the press of a switch instantly brought whatever was required. They must cultivate, he said, a rather different outlook. Their apparatus was, indeed, provided for them, but the convenience of their *x*-ray rooms and dark rooms would largely depend upon their own initiative. In other words, it was left for them to fashion their departments, taking advantage of such conditions or amenities as offered themselves, and relying upon their own resourcefulness and adaptability. They might not know what electrical supply was available, and in all sorts of matters which were taken for granted at home they would come up against primitive conditions, and must be prepared to be handymen, at least during the first month or two.

Reports of Societies

IMMUNOLOGICAL PROBLEMS OF DIPHTHERIA

At a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland on October 13 the president, Dr. R. A. Q. O'MEARA, delivered from the chair his presidential address, "A Critical Consideration of Some Immunological Problems, with Special Reference to Diphtheria."

Dr. O'Meara first considered the two principal experiments supporting the therapeutic value of diphtheria antitoxin—that of Fibiger in Copenhagen in 1898, and that of Roux, Martin, and Chaillon in Paris in 1894. Although Fibiger obtained good results with diphtheria antitoxin he was dealing with such a mild disease that its fatality rate of 12.2 per cent. in untreated cases was no greater than in areas where severe cases were actively treated with antitoxin to-day. There was evidence that the gravis type of diphtheria bacillus was associated with diphtheria in Paris about the time of the experiment in 1894. The French workers gave their results in two groups of cases—"angines" and "croups"—which for comparison with modern figures might be referred to as "non-laryngeal diphtheria with faucial involvement" and "laryngeal diphtheria." In the first group the fatality rate without serum treatment was over 30 per cent. for the period of the experiment. Serum treatment brought the fatality rate down to 12.4 per cent. Figures from the annual reports of Cork Street Fever Hospital showed that in a comparable group of actively treated cases the fatality rates for 1936, 1937, and 1938 were 17.4 per cent., 10.5 per cent., and 11.6 per cent. The dosage in any case in the original experiment did not exceed 8,500 units and was probably not more than 5,000. Against this, doses of 120,000 units or more were given to-day in severe cases. The conclusion would appear to be that there had been no improvement in the treatment of the toxaemia of diphtheria since antitoxin had been introduced, and that modern antitoxin, unit for unit, was less potent than that originally employed. The principles guiding the development of antitoxin in the interval had been mainly directed towards purification so as to ensure the maximum number of units in the minimum volume. The study of clinical efficacy of antitoxin had been relegated to a minor position. The development of diphtheria prophylaxis and other methods of immunization was suffering also by the fact that avoidance of reaction was being made the first criterion for an immunizing agent. The immunologist had become dazzled by the achievements of the chemist in isolating fractions of the organism which had antigenic properties and which could be injected without causing reaction. On the other hand, the work of Pasteur and the pioneers appeared to show that in order to get solid immunity against the causal organism it was necessary to use something very close to the whole organism and not a fraction of it. If the modern tendency continued it might eventually lead to the abandonment of immunizing methods as of no practical worth.

Professor J. W. BIGGER said that serologists and immunologists had shown in recent years a tendency to become too

academical. The president had pointed out that the results obtained in laboratories must be judged by the results of their application to the human body. It was of value to be reminded that the scientific evidence on which the use of antitoxin was based was slight. There were various reasons for this, but the chief was that from the beginning the treatment had been so obviously successful that few if any physicians had felt justified in continuing to treat control cases of diphtheria without antitoxic serum. There were three distinct types of diphtheria bacillus, which gave rise to differing clinical forms of the disease. The president had made a good case for believing that the diphtheria prevalent in Paris in 1894 was in the main due to the gravis type of bacillus. Diphtheria in Dublin to-day was due to the same type. It would not be true to say that antitoxin was useless in the treatment of diphtheria; it had definitely reduced the fatality rate of both gravis and mitis infections. But the treatment of diphtheria by antitoxin had not improved to the extent which one would have expected.

Professor HANS SACHS said that it was impossible to doubt that serum therapy was of value. Antitoxin not only neutralized the toxin but made it disappear altogether from the blood. It was possible to distinguish an antitoxic action and a non-specific action of the serum. The specific and the non-specific actions on the organism were quite different.

Dr. C. J. MCSWEENEY said that the president's paper pointed out the limitations of serum therapy in the management of gravis diphtheria. There was no doubt that in Dublin during the last five years the variety of diphtheria had been quite different from that which had prevailed in the British Isles and in Ulster. He showed a chart of the mortality rate which proved that the rate in Dublin was higher than in Cardiff, although the treatment of the disease was exactly the same in the two places. The hallmark of toxic diphtheria was the amount of faucial oedema; other factors were the extent of "bull neck" and the occurrence of haemorrhages into the skin and from the mucous membranes. These constituted the clinical signs of gravis diphtheria. The commercial antitoxin available at present seemed to check the spread of the membrane, but it had little if any effect on the undefined toxic factor. In his opinion 90 per cent. of the deaths happened within ten days of the development of the disease. With a very virulent organism something more potent than the existing antitoxin was required in order to ensure a minimum mortality rate.

Dr. G. C. DOCKERAY said that in 1931 he had tried typing diphtheria bacilli in Dublin and had found that they were predominantly of the gravis type. It was strange that the mitis type, which was haemolytic on culture, should not cause haemorrhagic lesions as a rule, whereas the gravis type, which was not haemolytic, should. Dr. A. R. PARSONS thought it difficult to know how much antitoxin to give. Some years ago good results had been achieved by the administration of 4,000 or 8,000 units; to-day it was said by some workers that the dosage should not go beyond 100,000 units, but that it was quite safe to give that amount. Was the present antitoxin not so good as formerly? Dr. B. MORAN referred to the diversity of factors which had to be considered when dealing with the problem of diphtheria. Dr. R. W. SHAW said that if a prophylactic known to produce a reaction in children were used it would be difficult to get permission from the children's parents to employ it. Dr. W. HAYES remarked that the concentration of antibodies had been a purely technical achievement and little real progress in treatment had been made since the 1890's. In small-pox an attenuated small-pox virus, in which all the elements of the real disease were present, was used as a prophylactic. In measles, immunity was procured by modifying the whole disease. Both methods gave an immunity comparable to the natural one. In diphtheria and in scarlet fever the degree of immunity produced artificially was not comparable with that following the disease itself. Dr. J. MCCANN observed that in the early days serum had been given subcutaneously with very good results; now it was given intramuscularly or intravenously. If the serum was administered in this way a large number of units might be excreted from the blood and lost almost as soon as they had been given; he suggested that serum might be injected subcutaneously as well. Dr. W. P. O'CALLAGHAN asked if there was any reason why infants in the maternity hospitals should not be treated with diphtheria prophylactic from birth. Dr. W. G. ELLIOTT asked if children inoculated with diphtheria prophylactic were in danger of becoming carriers; if they were they would be a source of danger to other school children. Dr. ALAN THOMPSON wanted to know if there was any hope of getting a better serum against gravis, and if gravis yielded a toxin in sufficient amount for the immunization of horses.

The PRESIDENT, in reply, said that his object had been merely to show that a problem existed, and not to say that diphtheria antitoxin should not be used in the treatment of diphtheria, or that diphtheria prophylactics should not be employed. Certain cases of severe diphtheria were not amenable to antitoxic therapy in spite of the fact that many alleged improvements had been made since the introduction of diphtheria antitoxin. The existing prophylactics were capable of yielding a high degree of immunity against diphtheria. It was well worth while using T.A.F., but parents should not be told that the child would certainly be protected against the disease. The fatality rate would soar in the absence of treatment with antitoxin. In immunology there had been too great a gap between laboratory and clinical work. There need be no relation between the haemolysis produced by the mitis type on culture and clinical haemorrhagic lesions. The latter would be due to capillary damage and not to haemolysis. In immunization it was important to use the whole organism and not isolated parts or products of it. It was said that infants in maternity hospitals were immune to diphtheria, and if this was so it would hinder the development of immunity from a diphtheria prophylactic. The immunity-forming mechanism of the infant might not be developed at so young an age. Children who received prophylactic inoculations did not necessarily have their tendency to become carriers increased thereby.

Correspondence

War Wounds of the Limbs

SIR,—The publication of Dr. Trueta's inspiring little book on the treatment of war wounds and fractures and the opinions expressed by Mr. R. Watson-Jones in his admirable letter in your issue of October 21 (p. 826) all point to a firm belief in plaster-of-Paris as opposed to other methods of fixation. Böhler's technique and his convincing contributions to the surgery of fractures are responsible largely for the revival and improvement of ancient practice.

It may be useful at the present time to remind students and the younger generation of surgeons that their forefathers had similar beliefs. In my student days Erichsen's *Surgery* was the favourite textbook for those beginning the study of surgery. In vol. i of the tenth edition, 1895 (forty-four years ago), it is stated that the unpadded plaster cast was employed at University College Hospital. Some modification of this was introduced, but there is a condemnation of the padded cast which is written in words almost identical with those of Böhler.

Thirty years ago I practised and published an account of the ambulatory treatment of fractures in plaster-of-Paris, a lesson learned from a visit to St. Thomas's Hospital and to the clinic of Kocher of Berne. Splints such as Carr's splint for Colles's fracture, Liston's long splint for fractures of the thigh, and Cline's splint were never used by my colleagues or myself. They were obviously ineffectual. It was the influence of Sir Robert Jones, and the knowledge of the unrivalled results his followers obtained in the last war, which induced many of us to abandon plaster-of-Paris as a routine in favour of his simple fixation splints. This change-over from plaster to splints was confined largely to war wounds. It is surprising to find how few modern writers understand the admirable extension and fixation which can be obtained when these

frames and splints are properly applied. Jones was modest about his own methods; he was thoroughly familiar with those of Böhler and interested in their development and use, but he appeared to avoid plaster when he could.

The late Lord Moynihan used to speak cryptically of "the hypnotic tube" which he inserted after gall-bladder operations. He subsequently explained that he used this term because he slept better when the tube was *in situ*. So it is with Jones's splints. By their use we are relieved of misgivings when we are not quite certain if the application of plaster is free from risk or, if applied, might require quick removal to obtain more accurate position.

I have beside me not only Böhler's and Trueta's books, but also, among others, *The Orthopaedic Surgery of Injuries*, *Injuries to Bones and Joints*, and *Notes on Military Orthopaedics*. These last three volumes are by Robert Jones. May I venture to advise others who are only familiar with plaster technique to include them in their library if engaged in war work.

One important point is mentioned by recent writers but has not been sufficiently emphasized. Wounded soft parts, especially when infected, require the same amount of fixation as broken bones. I drew attention to this in the *Lancet* (1936, 2, 1010) when dealing with the question of infected fingers and hand. In cases of streptococcal lymphangitis I found splinting the arm was essential. Bier's bandage was a help, but stupes, arm baths, etc., were forbidden. We now have the sulphonamide group of drugs as a powerful ally. Conservative treatment with rigid fixation was successful. Mortality too often was the result of too active surgical intervention. War wounds of the limbs are being considered along similar lines. Mr. Watson-Jones mentions that amputation has almost disappeared "from the repertoire of the traumatic surgeon." I do not like the words "traumatic surgeon," but he says very truly, at the end of a most helpful letter: "Amputation—to be performed only when the main artery is destroyed, so that gangrene is inevitable." The possibility of the reconstruction of a shattered limb, by methods which were well tried during and after the last war, must always be remembered by the surgeons working near the front line.—I am, etc.,

Aberdeen, Oct. 24. W. I. DE C. WHEELER.

Treatment of Infected Fractures

SIR,—Although a physician and general practitioner, I have just read with the greatest interest and admiration Professor Trueta's description of his treatment of air raid casualties. The technique of such a master of his art, by means of which a mortality of 0.6 per cent. resulted in a series of 1,073 cases, fully justifies your laudatory comments, and if Professor Trueta's method is applied as described by him it does seem as if "the whole treatment of war injuries will have been revolutionized."

At the present time the criticism of the value of Professor Trueta's contribution to war surgery in the letter by Mr. R. Watson-Jones (*Journal*, October 21, p. 826) is singularly unfortunate. The effect of this letter may be to deprive a number of younger surgeons (who have not had any experience of war surgery) of the pleasure and educational advantages of reading the book. Mr. Watson-Jones should remember that the only fair way in which destructive criticism can be effectively employed is when it is supported by rebutting statistics instead of vague generalities. What statistics can Mr. Watson-Jones supply in regard to modern war casualties which can compare with those of Professor Trueta's six deaths in a series of 1,073 cases?

One astounding assertion appears in Mr. Watson-Jones's letter. He states towards the end of his third paragraph that "the crushed and mangled limbs of severe motor crashes, *which differ in no respect from the injuries of modern warfare*, are restored to normal in a very large proportion of cases." No surgeon with any experience of either modern war injuries or those of the 1914–18 war would agree with the assertion which I have italicized. The remainder of this letter is a re-hash of hitherto employed orthopaedic methods, and gives me the impression that Mr. Watson-Jones has not read Professor Trueta's book carefully, and that possibly a further perusal of it may cause him to revise his views.—I am, etc.,

Manningham, Bradford, Oct. 23. A. HAYES SMITH.

Psychological Casualties in War

SIR,—Those of us who had to deal with the so-called shell-shock patients in the last war had hoped that something would be done next time to prevent a repetition of the psychiatric illnesses which were lumped together under that unfortunate name. The need for prevention does not require to be stressed. The intense misery of the patients, the infectious nature of the disease, so that it became a serious problem for those responsible for the prosecution of the war, and the unending burden to the community should be sufficient reasons for inquiring if there are any means of prevention available.

From many quarters conclusive evidence has been obtained that in a large number of instances a history of psychiatric illness was forthcoming before enlistment. It is reasonable to suppose that if these patients had been excluded from the Army there would have been fewer psychiatric casualties. It is generally believed that the bodies responsible for the examination of recruits are instructed to inquire into the mental history of the patient, but some of us who are interested in this aspect of illness are beginning to feel that the meshes of the net are too wide.

I have seen recently two persons who would not have been enlisted if attention had been paid to their histories. In one of these there was a prolonged history of repeated failure. He had to be taken from one school to another until when he was 15 his doctor, who had had him under observation for many years, wrote to his father that after due trial he had come to the conclusion that the boy could not stand the strain of public school life, and that all attempts to make him do so should be given up. Thereafter his education was conducted by tutors, and an attempt was made to study for a professional career. After he had passed some examinations his health again broke down, and for about a year before being called up for the militia he was occupied in trying to get it restored. The chief symptoms in each illness have been insomnia, attacks of terror—always worse away from home—severe indigestion, failure of concentration. Though this history and a certificate from a leading physician that the lad was totally unsuited for military service were communicated to the board, nevertheless the boy was passed fit for military service. The other patient joined the Territorials a year ago, and broke down with acute nervous symptoms about ten days after the outbreak of war. His history, though not so marked, has many incidents in it of minor nervous illnesses throughout his life. One accustomed to the study of psychiatric histories would certainly have suggested further investigation before he was accepted.

Even two swallows do not make a summer, and I have to admit that these are my only two specimens of the bird. But in conversation with my colleagues I have found that they also have been finding other examples. There must be many others.

It would be a great kindness if you, Sir, would afford me the hospitality of your columns to get this question investigated. If those of your readers who have knowledge of similar cases could send details to me at St. John's House, Smith Square, S.W.1, it might be possible to find out whether this is a serious problem or not. If these psychopaths are being generally enlisted, then we are doing our best to provide many occupants for psychiatric beds, not only because of the numbers actually enlisted but also because of the highly infectious nature of hysteria.

I am not suggesting a remedy for this state of affairs until I know something of the magnitude of the problem, but publicity may induce those responsible to realize that it is not unimportant.—I am, etc.,

London, S.W.1, Oct. 30. T. A. ROSS.

Psychological Treatment Centres

SIR,—A perusal of your correspondence columns recently, as well as those of a great diurnal contemporary, suggests that the zeal of some of our colleagues with a passion for psychotherapy may be undermining their judgment. It is natural that in their desire to be useful in this war, being baulked in their aspiration to treat the arch-dictator himself, they tend to exaggerate the importance of their possible part in the national effort. I am not sure that it is a good thing to advocate the setting up of "psychotherapeutic centres" throughout the land, unless these are to function as components of general hospitals; partly because the divorce of psychotherapy from general medicine is apt to have as its consequence a divorce from sanity, and partly for reasons connected with the following considerations.

A battle-cry for the rallying of psychotherapeutic centres may not have the reassuring effect on the public mind that is intended. It is reminiscent of a memorable saying of Dr. Edward Glover's, whose vision some years ago of a "solid phalanx of child analysts" aroused emotions in our hearts closer to the Roman associations stirred by the metaphor than its author could have desired. There is a risk at the present time of creating a national hypochondriasis by too wide advertisement of emergency psychotherapy, with its implications that many people are in special danger of breaking down under war conditions. The article by Dr. S. Barton Hall in your issue of October 21 (p. 801) shows the same general tendency. The cases he records and attributes to the pressure of war industry are not different from many that we have all encountered in times of peace. It would be a pity to encourage the belief that such cases are likely to be specially frequent now. The fact that these particular patients broke down so soon after engaging in war work points to their being special cases, ripe for a breakdown in any event. I have rarely seen a patient in whom overwork alone or principally was the cause of an illness of this type.

There are arguments even for thinking that mental breakdowns of any sort may be fewer in the civil population than during peace. Thus in the last war admissions to mental hospitals of females as well as males showed no increase, but rather the reverse. I have never heard of any data which purported to show a rise in psychoneurotic and minor psychotic illness, not admitted to mental hospitals, during the years 1914–18. On the other hand, I have met a number of "neurotic" people who were better during these years than before or since.

Moreover, on general grounds, which it would be tedious to detail here, there are reasons for expecting an improvement in the mental morbidity rate of the nation during a war. The only potential cause of a notable increase in the incidence of psychoneuroses among the civilian population is that from air raids; and even this, on the evidence of the only Spanish psychiatrist whose experience has been recorded in your columns, Dr. Mira, is possibly a mirage.

Dr. Geoffrey Evans (October 7, p. 742) has advocated that doctors in general should examine themselves and their own mental attitude at the present time. Psychotherapists of all sorts might take more comprehensive stock of the problems from a psychiatric angle if in addition they were to read Sir Robert Hutchison's address at the Canadian Meeting of the British Medical Association on "Hypochondriasis, Individual and National."—I am, etc.,

Matlock, Oct. 21. R. D. GILLESPIE.

SIR,—The essence of psychological treatment centres as suggested by me (*Journal*, October 7, p. 743) was that they provided immediately all the necessary arrangements for ensuring early contact between therapist and civil casualty—will Dr. W. Mayer-Gross (September 30, p. 701) and Dr. R. Louis Rose (October 21, p. 829) kindly note?—and this in a way which no existing national organization could.

I am grateful to Dr. R. F. Fidler (October 14, p. 783) for so helpfully calling my attention to the opening of psychiatric clinics in out-patient departments of general hospitals, but the phobic need of potential psychotics, who in point of fact avoid such clinics, calls for centres with a more euphemistic title and more accessible venue. If after six weeks the profession as a whole is unaware of this Ministry of Health scheme, is it likely that the lay public will know?. And when they know, will they not get the grim impression that secret arrangements were being made for ensuring their mental detention rather than their psychological freedom? The Barcelona experiences indeed point to the coming urgency for psychotic psychiatry, but also for the early establishment of preventive centres. Why wait till the chain breaks here too? Would it not be wiser to strengthen the weak links at once to preserve the chain's integrity?

The kindly notice of my plea by Sir Walter Langdon-Brown (October 14, p. 783) warned the profession that if it did not organize for psychotherapy now the authorities might disastrously let pass this valuable opportunity for launching a long-needed National Service. We can only have such organization either (A) from without or (B) from within. Scheme A at the dictation of an authoritarian political Ministry would be foisted forcibly on an unready profession when emergency acutely demanded that something be done quickly and in wholesale manner. Such a scheme would grow on us by accretion absorbing us along beautiful bureaucratic lines, uniform but unalterable, growing—but only as crystals and dead minerals grow—to embalm fossil Medes and Persians. Scheme B must be the outcome of voluntary co-operation in a comprehensive plan evolved among ourselves by co-ordination of living nuclei into related groups within the profession, a scheme growing by intercalation of outside material, growing not perhaps in such straight lines but growing as living organisms grow by preserving both integrity of life and inherency of adaptation. The "enlistment" suggested by me is a voluntary process under Scheme B, but until the Central Emergency Committee of the B.M.A. or some correlative body sees fit to ask all active psychotherapists to enlist *as such*, Scheme B cannot begin to function, as Dr. R. Louis Rose aptly (October 21, p. 829) pointed out.

It is asking too much of authoritative psychiatry to supply all the requirements of this new and gigantic psychological situation. The "no man's land" in psychopathology is as yet unexplored by official guides and unmarked on official maps. Scheme A at this juncture would have too many scotomata. After this war there will have to be a specific diploma in mental analysis, but meanwhile in the preparation of an itinerary every pioneer must be called in, every discovered tract must be marked in, and all this must be done now.

There is one notable precedent in medical history for the formation of local treatment centres as under voluntary Scheme B. During the distracted period of the Great Plague in the autumn of 1665, when all measures of official appeasement had failed to stop the spread of the epidemic, the poor apothecaries of London, the first "general practitioners," courageously remained in the "danger zones" when the theorist physicians and barber-surgeons had removed to safer areas. National acknowledgment came later when a Royal Charter of Incorporation of the Society of Apothecaries set the seal of public approval on their practical and humanistic efforts. Perhaps—who knows?—the Society of Apothecaries itself will come forward and offer to regulate and co-ordinate "Psychological Treatment Centres" in this grave hour of the nation's newer and stranger peril.

While early Rome slept, lulled into security by the comparative absence of frontal attacks and the safe silence of its blackout night precautions, barbaric Germanic invaders were secretly scaling into its strongest fortress because the cocksure sentries on that hill were fast asleep. It was a "mere goose" who saw the danger and issued the call. Civilization was saved—that time. Our "citadel" is being insidiously invaded on one of its strongest hills, and if a mere goose can but arouse all the psychological sentinels to man the mental walls at once that goose would willingly make way for more proper gander!—I am, etc.,

A. C. D. TELFER,
Walthamstow, October 22. M.B., B.S.Lond., L.M.S.S.A.

Treatment of Pulmonary Oedema from Gas

SIR,—I have read with interest Dr. H. L. Winter's suggestion as to the possible value of calcium salts in the prevention of pulmonary oedema in gas casualties (*Journal*, October 21, p. 828). I had previously considered the possibilities of these salts in this connexion, and had formed the opinion that their value was problematical.

The observations of Gold (*J. Pharmacol. exp. Therap.*, 1938, **34**, 169; and *Arch. int. Med.*, 1928, **42**, 576) that in the control of experimental pleural exudates large doses of calcium were required to inhibit the effects of moderate irritation, while intense irritation was not appreciably influenced by even large doses of calcium, indicate that calcium salts would in all probability be valueless in the severe cases in which theoretically they were most indicated—a probability in accord with my experience in other acute inflammatory manifestations. Transience of action would render calcium salts valueless in the prophylaxis of pulmonary oedema, as in the prophylaxis of other inflammatory lesions, while in their therapeutic application in the less severe cases early, adequate, and continued dosage is essential if any benefit is to follow. In the absence of experimental evidence confirming the value of calcium salts in severe pulmonary oedema in gas cases, the possible limitation of this therapy must be realized.—I am, etc.,

Newcastle-upon-Tyne, Oct. 24. A. E. W. McLACHLAN.

Treatment of Eye Injuries from Gas

SIR,—In a recent paper in the *Journal* by Mr. Arnold Sorsby (September 23, p. 641) and a still later one by Colonel E. M. Cowell (October 14, p. 778) the use of a 2 per cent. solution of bicarbonate of soda as an eyewash is recommended against mustard-gas irritation, and this appears to be generally accepted as the standard treatment in this country.

From lack of opportunity to make any comparative tests I cannot give a personal opinion on the relative value of any substitute or alternative remedy, but I venture to draw attention to a paper by Dr. Georges Bonnefon, an ophthalmic surgeon of Bordeaux, in which from a large experience gained in the great war (1914–18) he advocates the use of a saturated solution of sodium sulphate (800 parts) mixed with 200 parts of syrup of sugar. He claims that any sufferer, if provided with this in a pannikin and a pad of non-medicated absorbent cotton-wool, can lave his eyelids or even douche the eyes himself (unless too tightly closed by swelling) with less need for assistance in bathing by orderlies or other overwrought attendants. The lotion should be renewed every few hours, since it becomes soiled, and, indeed, when loaded with secretion becomes an irritant itself after repeated use. If the sufferer has reached a hospital where an eye-bath can be provided the treatment can be made more efficacious and penetrating with the lotion lukewarm. But the principle to be aimed at is to encourage the escape of the tears and on no account to bottle up them or the pores of lid glands by the use of ointments to the lid edges.

Whether the syrup has any chemical advantage against "l'ypérite, ou sulfure d'éthyl-dichloré," as the French call it, is not stated. It may possibly make the solution more tenacious, but it would be interesting to know whether it is essential, since sugar might be rationed if in greater demand than Glauber's salt. Moreover, one ingredient instead of two makes for simplicity in preparation. The value of the local application of a strong solution of sulphate of magnesia in reducing inflammatory swelling is well known, and I suggest that it might be worthy of trial in mustard-gas irritation. Like Sorsby and Cowell and others, Dr. Bonnefon condemns the use of cocaine as a local anaesthetic in the above cases on account of its tendency to cause desquamation of the corneal epithelium. In its place he advises butelline. But as a less transitory and more efficacious analgesic he prefers a 2 per cent. solution of dionine. His original paper appeared in the *Gazette hebdomadaire des Sciences médicales de Bordeaux*, No. 11, March, 1939, entitled "L'Œil Ypérité: son Traitement."—I am, etc.,

Edinburgh, Oct. 16. GEORGE MACKAY, M.D., F.R.C.S.Ed.

SIR,—In his interesting paper on ophthalmic services to the civil population in national emergency Mr. Arnold Sorsby states (*Journal*, September 23, p. 641) that experimentally immediate irrigation after the application of liquid mustard gas to the cornea is of no value. Would Mr. Sorsby very kindly say if liquid mustard gas is soluble in any vegetable fat such as olive oil or castor oil, and if any experimental work has been done on the value of immediate use of any such solvent which is harmless to the eye?—I am, etc.,

Oct. 10. AN OCULIST SOMEWHERE IN FRANCE.

*** We print below Mr. Sorsby's reply. The subject is also dealt with in a leading article at page 915.—ED., *B.M.J.*

Liquid mustard gas is fat-soluble. I do not know of any experimental work to test whether irrigation with oil is more effective than irrigation with bland lotions in overcoming the instantaneous damage to the cornea from liquid mustard gas. Seeing that mustard gas is a "persistent" substance and that inevitably a film of oil containing dissolved gas remains on the cornea after instillation into the conjunctival sac, it does not appear desirable to use oily substances in the treatment of eye injuries from gas. This view has recently been forcibly put forward by Bonnefon (*Gaz. hebd. Sci. méd.*, 1939, **60**, 168, and *Siècle méd.*, 1939, September 1). It is, moreover, doubtful to what extent animal experiments can be applied without considerable reserve. There is some evidence that during the last war eye injuries from gas were more serious in horses than in men, and it has been suggested that the more severe course in animals might be due to the absence in them of lacrimal secretion and its defensive mechanism. On this view frequent irrigation with bland lotions or with hypertonic solutions (such as saturated solution of sodium sulphate 800 grammes, solution of glucose 200 grammes) to induce osmosis has been advocated.

Prevention of Tuberculosis

SIR,—The National Association for the Prevention of Tuberculosis has decided to devote its activities in war time chiefly to propaganda and the care and rehabilitation of tuberculous patients and their families. Tuberculosis was a grave problem during and after the last war, when the death rate rose to the level at which it had been ten years previously. Overcrowding, food shortage, and general anxiety no doubt caused this result, and the position was infinitely worse in Austria and Germany. The disease affects the military as well as the civil population, and the National Association takes the view that tuberculosis is as much a casualty of war as a wound.

The National Association has a large number of affiliated care committees throughout the country. It is hoped to encourage them in their work by periodical visits from an expert adviser. The position at the moment is complicated by the fact that owing to the need for vacant beds sanatoria and hospitals for the tuberculous have been evacuated of their patients, in some areas very largely. The Ministry of Health has the position under review, and statements from the Minister in Parliament give ground to hope that some beds will shortly be liberated.

The Burrow Hill Sanatorium Colony in Surrey, which has accommodation for eighty-six tuberculous youths, who receive treatment and training, will be kept open, and there are at present a few vacancies.—I am, etc.,

Tavistock House North, Tavistock Square, W.C.1, Oct. 24. HARLEY WILLIAMS, Secretary-General.

Care of the Tuberculous in War Time

SIR,—In his letter in your issue of October 28 (p. 882) Mr. Somerville Hastings states, with reference to the London County Council, that the impression that the Public Health Department has virtually disappeared is inaccurate. In fact, "one has only to mention the Council's responsibility for the civilian sick, the maternity service, the treatment of venereal disease and tuberculosis, and for general public health to realize the extent of the work still being done at County Hall." Yet the position of the tuberculous patient, whether newly

diagnosed or partially treated, is a source of concern to many of us who are called upon to give advice at the present time.

At the outbreak of the war most of the county and L.C.C. sanatoria were partially evacuated and the major proportion of the beds were left empty; it is even possible that some of these beds have already been occupied by non-tuberculous civilian sick. This action, taken during a state of national emergency, is bound to lead in due course to certain inevitable consequences. First, a large number of patients with open pulmonary tuberculosis have been dispersed among the general population, and the incidence of phthisis will therefore shortly increase. Secondly, there are much-reduced facilities for the treatment of freshly diagnosed patients, who will in many cases not be able to commence their treatment until the disease has already advanced beyond the early stage at which the prognosis is reasonably good.

While it is everywhere recognized that the Emergency Hospital Service must have plenty of beds at its disposal, it is most dangerous to the community that the supply should be drawn from the tuberculosis service. Not a single one of these beds can be spared. The control of phthisis has taken many years to reach its present state of partial accomplishment, but the slightest neglect will result in a severe setback. It is also false economy. For many years to come the nation will have to pay, both in money and in precious lives, for any present failure to maintain our hold upon the disease.—I am, etc.,

London, W.1, Oct. 28. JAMES MAXWELL.

*** A deputation to the Minister of Health on this subject is reported at page 922.—ED., *B.M.J.*

X-ray Examination of Militiamen

SIR,—The question of the radiographic examination of militiamen has been raised in your columns by Dr. J. V. Sparks, and has been the subject of subsequent correspondence. The last letter on this matter, from Dr. Gregory Kayne (*Journal*, October 7, p. 745), brought up several points for discussion. I have waited in vain hoping that Dr. Sparks's abler pen would reply to these, but now, *faute de mieux*, I am writing myself.

The first and most important matter is that of the so-called miniature radiography, which Dr. Kayne asserts to be "still on trial and considered as unreliable by several authorities." This may be so, but it is also considered quite reliable by many other authorities. Personally I was unconvinced of the utility of this method until I had worked at it myself, but I am now sure that it should occupy a well-deserved and recognized place in our public health armamentarium. The result of my work was published in *Public Health* (September, 1939), where a brief résumé may be found of some of the results obtained by examining a comparatively large section of the populace.

Since publishing this paper I have been interested to learn that Messrs. Philips of Einhoven, Holland, who have very extensive factories, have used this method not only on their workmen but also on their workmen's families, with a resultant saving to the firm, after all expenses of the examination have been paid, of several thousands of pounds a year. This saving has been effected by the early detection of disease, with a resulting decrease in the amount of time spent on sick leave. I think it is not going too far to say that what is good business for a private firm in this matter must be good business for our community as a whole.

It must not be supposed that this method of examination is quite as accurate as a full-sized *x*-ray film, and the most that I claim for it is that it will pick out a large number of actual or doubtful cases that will be missed altogether by an ordinary screen examination. Such cases should be confirmed or otherwise by a routine *x*-ray examination later. It is interesting to note that the film cost for examining a thousand men by miniature radiography is approximately £2 8s. Whether some such examination should be carried out by physicians or radiologists must be a matter for local determination. Some localities have expert radiologists and not-so-expert physicians, while in others the converse may hold. Suffice it to say that there are in this country enough efficient doctors to carry out this work adequately, and to the satisfaction not only of the public health but also of the military authorities.

I apologize for my prolixity, but the subject is both extensive and, at the present time, important.—I am, etc.,

Newton Abbot, Oct. 24. A. ROBINSON THOMAS.

Treatment of Venereal Disease in the Field

SIR,—During the 1914–18 war there occurred among British troops 400,000 cases of venereal disease. These men were evacuated from their units and sent for treatment to a special V.D. hospital at the base. In consequence they were away from the field for many weeks—sometimes months. It is a matter of common knowledge that there were numerous instances of men deliberately acquiring venereal disease so as to avoid the dangers of the firing line. It is as an effort to prevent so far as possible this wastage of men that I put forward the following suggestions.

With modern methods of treatment there is no reason whatever why a man suffering from syphilis up to the end of the secondary phase, or from acute anterior gonococcal urethritis, should be evacuated from his divisional area. Such patients can be adequately treated within that area in a field ambulance, a C.C.S., or preferably by a special divisional V.D. unit consisting of an officer experienced in venereal disease and six orderlies. Such a unit might be attached to a C.C.S. It would, of course, require to be provided with the means of carrying out microscopical investigation for *T. pallidum* and the gonococcus.

For the treatment of syphilis the intravenous arsenical should be one such as stabilarsan, which is already in solution in the ampoule. A "914" powder preparation may also be used, the solvent consisting of an ampoule of sodium thiosulphate, so countering any difficulty that might arise in obtaining sterile distilled water. The arsphenamine injections should be given thrice weekly (say, on Monday, Wednesday, and Friday) in doses of 0.25, 0.30, and 0.45 gramme, making a total of 1 gramme in each seven-day period. The bismuth agent should be a liposoluble one, given intramuscularly twice weekly, the total amount of bismuth metal being not less than 0.2 gramme per week.

Though not normally an advocate of the concurrent intermittent method of therapy, I am of the opinion that in the special circumstances—treatment in the field—that method should be adopted. The schedule I suggest is:

Unit Course

Week	Arsphenamine (gramme)	Bismuth (gramme)
1	1.0	0.2
2	1.0	0.2
3	1.0	0.2
4	1.0	0.2
5	1.0	0.2
6	1.0	0.2
7	1.0	0.2
8	1.0	0.2
9	—	0.2
10	—	0.2

Eleventh to fifteenth week, patient returns to duty.
Sixteenth to twenty-fifth week, repeat unit course.
Twenty-sixth to thirtieth week, patient returns to duty.
Thirty-first to fortieth week, repeat unit course.
Forty-first to forty-fifth week, patient returns to duty.
Forty-sixth to fifty-fifth week, repeat unit course.
This is followed by serological examination every three months for two years.

The above represents adequate treatment and, when carried through, results in 100 per cent. cure rate. The man is not only rapidly rendered non-infectious, but even while he is under ambulant treatment he can in an emergency be sent, without danger to his comrades, to rejoin his unit in the line.

The proved efficiency of sulphapyridine (M & B 693) in the treatment of gonorrhoea renders the evacuation of such cases to the base quite unnecessary. The following routine, which has proved so successful at Whitechapel Clinic, can just as efficiently be carried out in the field.

Week 1: Tablets of sulphapyridine, 3 grammes daily. Posterior irrigation with potassium permanganate, 1:8,000.

Week 2: Tablets of sulphapyridine, 2 grammes daily. Posterior irrigation with potassium permanganate, 1:8,000.

If progress is satisfactory—no urethral discharge and urine clear—at the end of Week 2 stop treatment; otherwise continue treatment for Week 2 for a further seven days.

Week 3: Daily observation for three days, then tests for cure. Satisfactory results have been obtained without irrigations, but there should be no difficulty in carrying out these in the divisional area.

A certain small proportion of cases will of course develop complications due to the disease or to treatment, and these would be the only ones requiring evacuation to a special base hospital. Men on leave or proceeding to join their units in France found to be suffering from venereal disease should not be hospitalized in England or at the base, but as soon as they are non-infectious should be transferred for further treatment to their divisional area.—I am, etc.,

E. T. BURKE,
Director, L.C.C. (Whitechapel) Clinic.

Oct. 23.

Organization of First-aid Posts

SIR,—Recent excellent articles in the *British Medical Journal*, the short experience of the working of these posts by medical officers attached thereto and the A.R.P. medical officers, together with the firm front shown by the B.M.A. as to the payment of doctors, raise the question, Should the Ministry of Health not now assume entire control of and responsibility for the casualty services? Why dissociate such services which during a war are intimately connected with the hospital service? While the training of first-aiders and auxiliary nurses might well be left to the local authorities (and here I would plead for a higher standard) I certainly think that the control of the casualty services is best out of the hands of local authorities. For this there are many reasons into which I need not enter. Regarding the organization of the services I submit the following points for consideration:

(1) *Training and Recruitment.* As now, but councils to have the option of conducting their own courses and examinations, with presentation of certificates.

(2) *Administration.* The A.R.P. medical officer to be commandant of all the first-aid posts, personnel, equipment, arrangement of classes, and allocation of all personnel (doctors, nurses, matrons-in-charge, first-aiders, and stretcher-bearers). His decision to be final.

(3) *Collective Training.* This should be done by the commandant with brigade officers of the B.R.C.S. and St. John Ambulance.

(4) *Medical Officers to the Posts.* These to receive the present honorarium plus a sessional fee during a raid. They are there purely for the medical and surgical skill necessary. Most of them are general practitioners and cannot give time to collective training. The commandant should have power to call others.

(5) *Nurses at Posts.* The Government allows one trained nurse only for the first-aid room. What use would one nurse be for 50 to 100 casualties at a post? If in collective training and manning of posts there are to be three shifts of eight hours each, why should one of the most important grades of helpers be so reduced? The types of casualties to be met with demand at least one nurse for each room—the first-aid, reception, and resting rooms. In each a nurse may be occupied for some time on only a few cases. If she has to be useful for the more serious ones it is essential there should be some assistant nurses, and it is desirable before chaos occurs that the Ministry should give definite permission for these. In the mobile unit at least two trained nurses are necessary for shift work.

(6) *Decision on the Spot.* I cannot agree that ambulance men should have this responsibility—that is, of deciding where the case is to go. As a rule the best men fight shy of this because they do not attend to the casualty on the spot, which is done by the first-aid party. These contain the cream of the first-aiders and their leader is a chosen man. In the absence of a doctor, a trained or assistant nurse, the leader must give the order, and in his absence No. 1 of the stretcher party.

(7) *Mobile Units.* More use of these should be made. They are cheaper than heavy expenditure on the conversion of buildings (schools, etc.).

(8) *Posts at Hospitals.* I am of the opinion these should not be at any hospital. Let the out-patient departments carry on and during any raid let them treat what casualties come.

(9) *Gas Casualties.* These should not be taken to a hospital unless special means are provided for them. Special mobile vans, equipped with a bath and spray, should be fitted up so that the gas casualties can be immediately treated on the spot and the clothes decontaminated in a solution in special bins. The vans and bins are taken to a special area afterwards for decontamination by a special squad, and the inside water tanks replenished.

(10) *Equipment.* The surgical equipment for the posts is meagre. Ether should not be used there with so many chances of danger. Morphine, nembutal, and chloroform (safe, given on lint, for analgesia) should suffice. One table to lay a patient on is absurd. It is easy and cheap to have heavy wooden props, which won't tilt, to hold the handles of stretchers so that nurses and first-aiders are not constantly on their knees to dress cases.—I am, etc.,

"CASUALTY SERVICE."

Oct. 17.

Diabetes and Renal Disease

SIR,—We feel that Dr. K. E. Barlow's article on diabetes and kidney failure (*Journal*, October 14, p. 765) cannot be let pass without comment, as the conclusions drawn are so contrary to all previous experience of diabetes. He describes two cases in insufficient detail to make a full critical discussion by us possible, but certainly Case II seems to present a picture of heart failure rather than uraemia, and there is no clear evidence of diabetes; the slight abnormality in the blood-sugar curve is most likely due to previous vomiting and ketosis. Dr. Barlow's conclusion that nephrosclerosis lowers the renal threshold for glucose is the exact opposite of our own and other experience, where renal sclerosis is mostly associated with a high threshold. He further suggests by some process of reasoning obscure to us "that the mild diabetic is better off with nephritis than without it." We entirely disagree with this baseless statement because, while there is adequate means of dealing with diabetes both mild and severe, there is no means of checking the inevitable progression of nephrosclerosis.—We are, etc.,

R. D. LAWRENCE,
W. G. OAKLEY.

The Diabetic Clinic, King's College Hospital, London, S.E.5,
Oct. 30.

Urethrography

SIR,—May I refer to the letter of Dr. Paul Cave and Dr. G. L. S. Konstam (*Journal*, October 14, p. 786), whose comments on my article on urethrography were of particular interest to me. The constant-stream technique is of value in viewing the urethral canal under the screen. This may be done with the glass syringe. Using the syringe, however, one does not always get a film of the prostatic urethra in a distended state, but one does see the prostatic urethra in outline. This gives an entirely satisfactory picture in all but a few specific cases. By a manometric method the larger amount of fluid injected, the added difficulties, and the elaboration of technique are apt to vitiate rather than improve the value of the urethrogram. Moreover, the moving stream implies a moving urethral wall, and this clouds the *x*-ray photograph.

As for the prone position, this does not in fact bring the posterior urethra any closer to the *x*-ray film. Moreover, the technique of injecting the fluid with the patient in this position requires acrobatic contortions and difficult prestidigitations to which the ordinary urologist is somewhat unaccustomed.

The use of urethrography as a method of estimation of residual urine would necessitate the initial filling of the bladder with as much, at times, as two or more pints of lipiodol. This is expensive. It would also necessitate the use of logarithmic tables to convert the inches of the shadow into the ounces of the fluid. This is inexact.—I am, etc.,

JAMES KEMBLE.

London, W.1, Oct. 26.

Mental Health of Children

SIR,—Under this heading in your issue of October 28 (p. 880) a statement which is perhaps capable of misinterpretation was made with regard to the Children's Department of the Tavistock Clinic. We should be grateful if you would allow us to point out that the practice of the Tavistock Clinic, in both the adults' and children's departments, does not now vary from pre-war days. We believe that it is therapeutically sound for everyone to pay what he can for treatment, and, where possible, we ask patients to pay a minimum fee of 3s. for a treatment interview. Under war conditions this policy is unchanged.

The risk of confusion arises from the fact that during war time a group of psychotherapists are separately carrying out private work in the same building at ordinary consulting fees.—I am, etc.,

A. T. MACBETH WILSON, M.B., Ch.B.,
Acting Medical Director.

The Tavistock Clinic, Westfield College,
Kidderpore Avenue, Hampstead,
N.W.3, Oct. 30.

Universities and Colleges

UNIVERSITY OF OXFORD

The clinical sub-dean of the Medical School, Oxford, announces that the quota of foreign refugee doctors at the Radcliffe Infirmary is now full, and that no further applications can be considered at present.

UNIVERSITY OF CAMBRIDGE

Diploma in Medical Radiology and Electrology

Owing to the national emergency it has been decided to shorten the present course from nine to six months and to hold examinations on the following dates: Part I, December 19, 1939, and April 10, 1940; Part II, April 9, 1940, and July 9, 1940. There will be no examinations for Part I in February and July, nor for Part II in October, 1940.

UNIVERSITY OF LONDON

BRITISH POSTGRADUATE MEDICAL SCHOOL

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—Alice Benjamin, J. S. B. Bray, J. J. Dubash, S. Sivasankara Pillai.

On September 28 the degree of D.Sc. was awarded to T. C. Angus (London School of Hygiene and Tropical Medicine).

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the Royal College of Physicians of London, held on October 26, with the President, Sir Robert Hutchison, in the chair, Dr. H. L. Tidy and Sir Adolphe Abrahams were re-elected members of the Committee of Management, Sir Comyns Berkeley a representative on the Central Midwives Board, and Sir William Willcox a member of the Poisons Board.

Licences

Licences to practise were conferred upon the following 297 candidates (including thirty-nine women) who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board, and have complied with the necessary by-laws:

F. Abadir, J. J. Ll. Ablett, A. J. Abraham, G. H. Adams, P. S. Adler, C. D. Alergant, L. L. Alexander, O. P. Allcock, R. H. Anthony, F. R. Aston, F. A. S. Austen, R. C. Baird, H. M. Balfour, D. A. Barley, Rotha H. Barnfield, T. E. Barwell, G. A. Beck, A. L. T. Beddoe, Eileen M. Benison, G. Beven, A. Bloom, D. W. Boatman, D. C. Bodenham, Norah H. Bore, C. F. Bose, A. R. Bradley, J. B. Bramwell, O. B. Brears, M. O. Brigstocke, C. A. Brockbank, B. N. Brooke, H. P. Brown, P. P. Brown, C. E. Brownridge, M. R. Bull, W. W. Burnett, Phyllis Burvill-Holmes, Alice M. F. Butterworth, R. F. Butterworth, J. G. Byrne, E. M. Calvey, P. S. G. Campbell, B. E. Camus, R. U. Carr, R. A. M. Case, J. E. Cawthorne, C. A. Cheatle, A. A. Clay, L. G. Clayton, W. T. K. Cody, P. C. Collinson, Beatrice Colvin, Ruth M. Colyer, R. S. Cox, Mary Crago, R. Crawford, G. D. Cribb, J. D. Cronin, T. H. Cullen, K. Damodaran, H. A. Davidson, E. R. Davies, F. W. T. Davies, J. N. P. Davies, W. O. Davies, R. L. G. Dawson, Ina J. Dennis, F. A. Denz, P. J. De Vescovi, R. A. B. Dickson, J. W. Doupe, J. R. Dow, Margaret S. Drinnan, M. B. Dworkis, H. Dyson, J. E. G. Earle, A. K. Eastwood, D. A. J. Ebrill, H. D. Eddy, P. K. D. Edmunds, Evelyn M. Eldrid, E. L. Ellis, H. V. W. Elwell, J. R. Elwell, T. D. V. England, A. E. J. Etheridge, M. O. Evans, I. S. Eve, Enid J. Fair, B. E. Finch, D. Feldman, F. J. Fish, G. R. Fisk, Joan M. Foss, A. J. Freese, Lilias M. P. Gairdner, Gwladys Garfield, I. B. Gartside, M. R. Gaster, P. H. G. Gell, E. Gibbon, F. J. Gillingham, C. V. Gledhill, J. Glucksman, N. H. H. Golledge, L. C. L. Gonet, D. J. H. Goodhew, J. H. Gould, G. H. Grant, M. J. Greenberg, B. G. Gretton-Watson, G. C. Griffiths, R. G. Griffiths, J. A. G. Gulliford, C. Halamandres, J. Halstead, J. M. Hamer, J. K. Hampshire, A. G. Hardy, Freda M. O. Harries, T. H. Harrison, J. R. Hart, R. H. R. Hartley, S. F. Hasan, G. C. Haslam, P. S. Hawkins, A. F. Hayden, S. T. Hayes, E. G. Herzog, S. L. Hetherington, W. S. Higgs, S. W. Hinds, E. Hirschowitz, H. E. Hobbs, Elizabeth M. Hollands, Portia G. Holman, Jean M. Holtzmann, W. F. Hooton, A. M. Horsnell, C. R. Houghton, H. Houghton, J. C. Houston, D. R. S. Howell, J. S. Howitt, A. Hughes, E. B. Hughes, H. O. Hughes, J. G. Hughes, I. Illingworth-Law, E. V. Irwin, R. H. Isaac, J. A. James, J. W. M. K. Jayewardene, J. R. F. E. Jenkins, H. B. Jones, Megan E. Jones, O. H. Jones, P. H. Jones, F. E. Joules, Joyce A. Keeping, G. W. Kennedy, R. D. Kennedy, W. G. Kenton, A. G. Leakey, Colette D. G. Le Doux, A. Levin, C. B. Lewis, N. S. Lockyer, P. B. Longden, S. C. Lovell, J. Lynch, R. L. P. Lytle, R. W. J. Maclure, J. C. McConnachie, Hilary Macfarlane, A. C. Mackay, G. K. Marshall, J. G. Mathewson, J. E. M. Melville, J. McM. Mennell, P. A. Menon, W. H. H. Merivale, Edith S. M. Merry, B. U. Meyer, E. W. Miles, I. H. Miller, C. J. Milligan, E. Millington, Mary R. More, Margaret E. Morgans, A. Morgenstein, Margaretta D. Morrell, O. D. Morris, A. Murray, R. A. Murray, E. J. A. Needham, E. Neumark, J. Newsome, J. W. Nicholas, C. G. Nicholson, R. S. Nicholson, Doreen Nightingale, D. A. Osborn, W. J. O. Page, F. D. P. Palmer, P. J. E. B. Palmer, W. R. K. M. Parry, A. Ll. Patterson, J. W. Paulley, S. D. Perchard, Edith O. V. Perry, Lorna C. Petersen, E. E. Philipp, S. Pillai, P. B. Pillay, A. S. S. Playfair, M. R. Pollock, R. C. Ponder, S. H. M. Price, A. H. Pritchard, T. J. F. Pugh, J. D. Randall, T. H. Redfern, J. J. Reeks, J. C. A. Renshaw, T. V. H. Richards, A. G. Riddell, E. Ridehalgh, F. W. B. Rilstone, V. H. Roberts, G. A. Robinson, L. Rosen, H. A. Rowley, M. S. Rowley, R. S. Rowntree, R. J. Russell, J. C. Ryle, E. Schlesinger, G. B. Schofield, F. H. Scoones L. G. Scott, W. McC. Scott, C. J. P. Seccombe, P. G. Seed, M. P. Shapiro, A. E. A. Shaw, Margaret M. Shrubsall, K. W. C. Sinclair-Loutit, L. E. Smith, A. G. Spencer, P. N. Stanbury, G. B. Stanford, R. N. Stansfield, N. Stephen, A. V. Stevens, A. A. Stonehill, G. B. Stratton, J. D. Stride, P. R. Stringer, W. G. Sugden, J. H. Swan, L. A. Sylvester, Maggie Tan, P. Tettmar, A. C. Thackray, J. M. Thom, C. C. Thomas, G. L. E. Thomas, G. A. Thompson, Jean F. Thompson, J. F. Thompson, Phyllis M. Timothy, T. E. Tuley, P. M. Turquet, P. A Tyser, C. H. C. Upjohn, H. D. S. Vellacott, R. C. Vevaina, Margaret H. Vickery, Edith W. Wagstaff, B. E. Welton, G. C. C. Wharton, Merle Whitehead, W. R. D. Wiggins, D. R. C. Willcox, J. M. Willcox, Emily K. Williams, H. W. G. Williams, J. Ll. Williams, J. N. Williams, C. W. Wilson, R. C. Witt, S. Witt, E. Wolfendale, P. H. Woodcock, Alice Yates, J. A. Yates.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Reopening of the Museum

The general anatomical and pathological collections will be open for inspection as from Monday, November 6, at the following times: Mondays to Fridays, 10 a.m. to dusk; Saturdays, 10 a.m. to 1 p.m.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the quarterly meeting of the Council, held in the College House, London, W., on October 28, with the President, Professor W. Fletcher Shaw, in the chair, Walter William Chipman, M.D., F.R.C.S.Ed., F.A.C.S., F.R.C.S.(Can.), LL.D., Emeritus Professor of Obstetrics and Gynaecology, McGill University, Canada, was admitted to the Honorary Fellowship of the College (*in absentia*).

M. Datnow, Liverpool, was admitted to the Fellowship (*in absentia*).

The following were admitted to the Membership (*in absentia*):

B. H. Anderson (Melbourne), A. W. Andison (Canada), G. W. Blomfield (Leeds), D. R. Cairns (London), W. D. A. Callam (Edinburgh), D. G. W. Clyne (London), Molly C. Devenish-Meares (Sydney), D. S. Greig (London), T. N. Hart (Bolton), W. Hawksworth (New Zealand), W. M. Lemmon (Melbourne), G. G. Lennon (Birmingham), F. H. Lord (Melbourne), R. Lyons (Canada), T. A. MacFarland (New Zealand), D. M. W. Maxwell (Windsor), S. Misra (Calcutta), D. V. Morris (Galway), R. I. Ritchie (New Zealand), T. F. Rose (Sydney), Everell M. Shippam (London), R. de Soldenhoff (Lyme Regis), G. B. Thomas (Lahore), S. L. Townsend (Melbourne), J. D. Watt (Romford), Ella Windeyer.

Grace Johnston Cuthbert, Sydney, was elected to the Membership.

Mr. J. P. Hedley assumed the office of honorary treasurer in place of Mr. Eardley Holland.

The examinations for the M.R.C.O.G. and the D.R.C.O.G. will continue to be held, and the activities of the College are being maintained.

The following have been awarded the Diploma of the College:

J. J. Carter (Co. Down), Penuel M. E. Chitty (London), S. Bender (Liverpool), J. V. Dhurandhar (Bombay), Phillis Dingle (Liverpool), K. W. Evans (Liverpool), W. W. Gilford (Reading), G. Gillies (Burton-on-Trent), W. Heng (Hong Kong), J. R. E. James (Carmarthen), J. E. Jameson (Moreton-in-Marsh), V. N. Khadilkar (Bombay), O. P. D. Lawson (Bellshill), S. Madden (Leeds), J. M. McKiddie (Aberdeen), K. S. E. MacRae (Liverpool), Mabel G. Miller (Manchester), Anne C. Robertson (Hull), I. Rose (Barnsley), K. C. Shah (Bombay), P. N. Simons (Sydney), I. E. J. Thomas (London), R. M. Williams (London), J. W. E. Webster (Aberdeen), L. A. C. Wood (Penshurst).

SOCIETY OF APOTHECARIES OF LONDON

Mastery of Midwifery Examination

In view of the present unsettled conditions the examination for the Mastery of Midwifery will not be held in November this year. The examination next May will be held as usual if circumstances permit. Regulations and forms of application for admission to the examination may be obtained from the Registrar, Society of Apothecaries of London, Water Lane, Queen Victoria Street, E.C.4.

The following candidates have passed in the subjects indicated:

SURGERY.—B. Berman, J. J. Brenner, W. R. Dyke, R. G. Feast, M. C. Fulton, E. F. Gleadow, M. C. Mair, S. T. Nakib, G. L. L. Reynolds, E. G. F. Skinner, D. Specter, J. A. Sutton.

MEDICINE.—W. R. Dyke, M. C. Fulton, G. Hannigan, S. Krishnan, J. Marks, T. Owen, T. I. Palmer, W. E. Roden, J. C. Scott, H. F. Sparling, E. A. Spouse, W. N. Vellacott, C. E. Winterstein.

FORENSIC MEDICINE.—W. R. Dyke, M. C. Fulton, G. Hannigan, J. Marks, T. Owen, W. E. Roden, J. C. Scott, H. F. Sparling, E. A. Spouse, W. N. Vellacott, C. E. Winterstein.

MIDWIFERY.—T. A. H. Adkins, M. E. Davies, W. R. Dyke, A. A. M. Easton, G. E. H. Enderby, M. C. Fulton, R. H. Gaman, P. Haden, A. Hannun. W. D. Jenkins, H. A. Kreiser, A. P. Motley, S. J. P. Ras.

The diploma of the Society has been granted to J. J. Brenner, M. E. Davies, W. R. Dyke, M. C. Fulton, W. D. Jenkins, S. Krishnan, M. C. Mair, A. P. Motley, S. T. Nakib, T. Owen, T. I. Palmer, G. L. L. Reynolds, W. E. Roden, H. F. Sparling, D. Specter, W. N. Vellacott, C. E. Winterstein.

The Services

HONORARY PHYSICIAN TO THE KING

The King has approved the appointment of Colonel G. G. Jolly, C.I.E., V.H.S., I.M.S., to be Honorary Physician to the King as from August 17, 1939, in succession to Brevet Colonel R. N. Chopra, C.I.E., I.M.S., who has retired.

HONORARY SURGEON TO THE KING

The King has approved the appointment of Colonel J. Taylor, C.I.E., D.S.O., V.H.S., I.M.S., to be Honorary Surgeon to the King as from August 30, 1939, in succession to Colonel Sir Alexander J. H. Russell, C.B.E., I.M.S., who has retired.

DEATHS IN THE SERVICES

Lieutenant-Colonel CHARLES WALTER HOLDEN, C.M.G., D.S.O., R.A.M.C. (ret.), who died at Sheffield, aged 60, was educated in the school of the Royal College of Surgeons in Ireland, and took the L.R.C.P. and S.I. in 1900, and subsequently the D.P.H. of the Irish Colleges and the D.T.M. and H. at Cambridge. After qualifying he filled the post of resident physician at the Whitworth Hospital, Dublin. He entered the R.A.M.C. as lieutenant on January 31, 1903, became major on September 1, 1914, and received a brevet lieutenant-colonelcy on June 3, 1918, retiring on May 15, 1926. He served as civil surgeon in South Africa from March, 1901, to February, 1902, taking part in operations in Cape Colony, and received the Queen's medal with three clasps; and in the war of 1914–18, when he was mentioned in dispatches. He was a member of the British Medical Association for twenty-seven years.

Obituary

SIR PATRICK HANDYSIDE

Surgeon Rear-Admiral Sir Patrick Brodie Handyside, K.B.E., C.B., whose distinguished service career was recorded briefly in our last issue at page 890, was born in 1860, a son of John Brodie Handyside of Fenton, Drem, who for many years, and also his father before him, farmed West Fenton. Educated at Edinburgh Academy, Patrick Handyside studied medicine at the University of Edinburgh, and after graduation was appointed assistant surgeon in the Royal Navy in 1884, shortly after his twenty-fourth birthday. In 1903 he was promoted fleet surgeon "for conspicuous professional merit," and his subsequent rapid advancement to the rank of Surgeon General was largely due to recognition of his sound professional knowledge and administrative ability. His inquiries into the health of the Japanese Navy and Army, both in Manchuria and Japan, earned him public appreciation from the British and Japanese Governments. Sir Patrick's oversea service included the North America and West Indies station, Cape of Good Hope, Esquimalt Hospital, and China. His service in this country was largely spent in appointments at the Royal Naval Hospitals at Plymouth and Chatham, and from the latter hospital he retired in 1920 with the rank of surgeon rear-admiral. His retirement to Gullane did not end the activities of a full and vigorous life; he was deeply concerned for the well-being of ex-service men and accepted office as honorary president of the Gullane Branch of the British Legion. He also interested himself in local politics and was a member of the East Lothian County Council. The funeral took place privately in Edinburgh.

JOHN ELLISON, F.R.C.S.Ed., F.R.C.O.G.

Surgeon, Chelsea Hospital for Women

We regret to announce the death on October 19 of Mr. John Ellison, the well-known gynaecologist, who was for many years a member of the visiting staff of the Chelsea Hospital for Women.

Born at Jullundur in 1886, he was educated at All Hallows School, Honiton, and Downing College, Cambridge, graduating B.A. in 1909 and taking the M.B. and B.Ch. degrees in 1912. His early appointments were those of house-surgeon, resident obstetric assistant and gynaecological registrar at St. George's Hospital, where he had won a university scholarship from Cambridge. Deciding to devote himself to diseases of women, he served as registrar at the Samaritan Free Hospital, at the General Lying-in Hospital, and at the Chelsea Hospital for Women, and after taking the F.R.C.S.Ed. in 1918 he was elected assistant gynaecological surgeon to the Grosvenor Hospital for Women, and surgeon to out-patients at Chelsea. Later he became consulting gynaecological surgeon to the Watford Peace Memorial Hospital, the Woodford Jubilee Hospital, the Chislehurst, Orpington, and Gray Valley Hos-

pital, and the Bute Hospital, Luton; he was also consulting surgeon for puerperal fever to the Counties of Hertford and Bedford. He joined the British Medical Association in 1925 and was elected F.C.O.G. in 1934.

Mr. Victor Bonney writes: Will you allow me to pay a tribute to the memory of John Ellison, whose premature and sudden death has come as a great shock to his many friends. I was intimately associated with him at Chelsea Hospital for Women for a long period, during part of which I had the advantage of his assistance in the operating theatre. He combined a wide knowledge of the specialty he practised with sound judgment and sterling common sense. Naturally averse, I think, to anything that savoured of the spectacular, he yet as a surgeon was most fully equipped, and adorned with manipulative skill and unswerving conscientiousness an operative repertory which commanded every gynaecological procedure performed at the present day. His colleagues and all who knew him will long deplore his departure.

GEHEIMRAT DR. HANS HORST MEYER

Geh.Rat Hans Horst Meyer, whose death on October 6 is announced at the age of 86, was the chief direct inheritor and transmitter of tradition from a great era which, under Binz, Buchheim, Schmiedeberg, and Böhm, saw the foundation in Germany of pharmacology as an experimental science. Meyer was a pupil of Ludwig and of Schmiedeberg, and after a brief tenure of the Chair of Pharmacology in Dorpat, held those in Marburg and in Vienna for the main periods of his active career. His name will always be associated with the theory connecting anaesthetic activity with relative solubility in water and lipoid solvents, put forward at the same time and independently by E. Overton. Other well-known researches by Meyer dealt with the natural and artificial muscarines, and with local tetanus, the latter in association with the late F. Ransom. No list of Meyer's published researches, however, can do justice to his position and influence in pharmacology, which spread far beyond his own country. A man of distinguished and attractive personality, he made many contacts here and in America, as well as on the continent of Europe. The textbook of experimental pharmacology which he wrote with the late R. Gottlieb is a standard work kept up to date till recently with his pupil and successor, E. P. Pick, now in America. Another distinguished direct pupil of Meyer is O. Loewi, professor in Graz till 1938. At any international gathering of pharmacologists in recent years the thoughts of those present from all countries turned to Meyer, with the desire to send a message of affectionate respect to the venerable master of their science.

H. H. D.

Among the late Mr. ARTHUR THOMAS PITTS's dental appointments (writes "D. N.") there was none which gave him more pleasure and which was of greater service to the community than his long connexion with the Hospital for Sick Children, Great Ormond Street. Mr. Pitts's association with this hospital began more than thirty years ago as clinical assistant to Mr. Warwick James, who was then dental surgeon to the hospital. On Mr. James's resignation in February, 1914, Pitts was elected to succeed him, and he occupied the post for more than the usual fifteen years of active service to the hospital, for during the last war he served with great distinction during the years 1914–19. He was so interested in his work at Great Ormond Street that at the end of the normal period of service he applied to the Board of Management for an extension of the tenure of his post. This was willingly granted, and on his resignation in October, 1930, his long and valued services to the hospital were recognized by his appointment as consulting dental surgeon. Pitts was devoted to children and they to him, with the result that they willingly attended his clinics, realizing, as if by instinct, that all he did was for their benefit. Among the many aspects of dental surgery in which he was interested was the relation of oral manifestations to systemic disease in children, to the discussion of which he gave a stimulating opening address at a meeting of the Royal Society of Medicine in 1927. Congenital syphilis was among the diseases discussed, and in this disease he had long interested himself. He was a great admirer of Sir Jonathan Hutchinson and was well acquainted with all his writings on syphilis. In his dental clinics at Great Ormond Street Pitts was always on the look-out for teeth suggestive of congenital syphilis, and on many occasions his suspicions were confirmed by subsequent blood tests. It is to be hoped that his teaching on this branch of paediatrics, which is too little studied by dentists as well as doctors, will not have fallen on stony ground, and that it will be remembered and applied by his disciples and pupils. The present writer was greatly indebted to him for much valuable co-operation on a subject in which we were both interested. This help was always willingly given, and in his clear and incisive manner. His premature death is a great loss to the two professions of which he was a valued member. Our sympathy is extended to his widow, who was formerly a nurse at Great Ormond Street, and to his family.

Dr. HENRY A. ELLIS, who died at Crowborough on October 3 after a long illness, was born on July 24, 1861, the fourth son of Colonel Francis Ellis of Omagh, County Tyrone. He was educated at St. Columba's, County Tyrone, and privately at Stratford-on-Avon, and qualified at Trinity College, Dublin (M.B. 1884, B.Ch. 1885). In 1885 he went to Australia, and was a resident at Sydney Hospital for two years. From 1890 to 1894 he held the posts of honorary surgeon and physician to the hospital. For the next nine years he was medical officer of health for Western Australia and superintendent to the Government Sanatorium, Coolgardie. He played a prominent part in Australian politics during these years, sitting in Parliament from 1903 to 1906 and supporting energetically the successful movement for Federation. Returning to England in 1913, Dr. Ellis was tuberculosis officer in Middlesbrough throughout the war and a commandant of the Red Cross Society. In 1919 he came to London as assistant physician at the Margaret Street Hospital for Diseases of the Chest. He married in 1913 Emily K. Gordon Wylie, third daughter of the Rev. David Stewart Wylie of Adelaide, South Australia. Dr. Temple Grey writes: Ellis will be sorely missed in the comparatively small circle that was privileged to know him. Big in body and mind, he had an uncommonly commanding appearance. His wide experience and unconventional modes of thought with many whimsical expressions were less appreciated than they might have been except by his friends. His rare talents, little short of genius, were employed chiefly so far as medicine is concerned on the elucidation of constitutional types from a chemical point of view. His work owed its value less to his technical equipment than to his broad imagination and singular inventiveness. I have never seen or heard of such elaborate analyses of the urine as he used to make, including the estimation of the Mg, Ca, K, and Na almost as a routine. Every medical man should read his *Reaction and Disease* (Lewis), and as for his capillator for the determination of the *p*H, those who have not used it have much to learn about time-saving methods. A few of us formed with him in 1928 the Ringer Society, which used to meet on Sundays, but seven days' work a week proved too much for all of us except Ellis, and the society ceased to meet.

We regret to announce the death of Dr. JOHN KENNEDY, of High Road, Leyton, which took place at his home on October 24. Only ten days before Dr. Kennedy carried out his professional duties, although suffering with angina pectoris, from which malady he succumbed. Born in Coatbridge sixty-two years ago, he was educated at Glasgow University. After graduating M.B., Ch.B. in 1902 he held posts at the Glasgow Royal Infirmary as house-surgeon and house-physician, and subsequently was resident assistant physician at the Ruchill Fever Hospital, Glasgow. He came to Leyton thirty-two years ago and took over a large practice in the heart of the town. He had been a well-known and popular figure in the life of

Leyton for a whole generation. He was district medical officer for the Essex County Council, and emergency medical attendant to the Leyton Isolation Hospital. He was a member of the British Medical Association since 1911, a Freemason of the Coatbridge Lodge, and a member of the Chingford Golf Club. He leaves a widow and two sons, for whom much sympathy is felt, and is survived by his aged parents and sister, who live at Bothwell, and by his brother, Dr. Alexander Mills Kennedy, physician to the Cardiff Royal Infirmary. The funeral took place on October 27 at the City of London Cemetery.

Mr. PHILIP NORTHCOTT VELLACOTT, formerly of Bloemfontein, died on October 24, at Crowborough. A student of Guy's Hospital, he graduated M.B.Lond. with honours in obstetric medicine in 1895, took the English Conjoint diplomas in 1896, and the B.S. in 1897. For a time he was captain in the Orange River Colony Division of the South African Constabulary, and in 1901 obtained the F.R.C.S.Eng. In 1908 he contributed an article on hydatid disease to the *South African Medical Record*. Mr. Vellacott was vice-president of the Orange Free State Branch of the British Medical Association in 1914–15 and 1922 and president in 1924–5 and 1932–3. During the last war he held a commission as temporary Major R.A.M.C. in the British Expeditionary Force.

News has been received of the death at his home in Claremont, Capetown, of Mr. ARTHUR RONALD MCLACHLAN, who was honorary surgeon to the Woodstock Hospital, Capetown, and additional honorary surgeon to the New Somerset Hospital, Capetown. After studying medicine at Guy's Hospital and taking the English Conjoint diplomas in 1899 he obtained the F.R.C.S.Eng. in 1901, and served as civil surgeon in the South African Field Force. Mr. McLachlan joined the British Medical Association in 1904 and was chairman of the Capetown Division in 1932.

The late Professor SANTESSON, who died from coronary thrombosis on July 26 in Sweden, held at one time the chair of pharmacology in Stockholm. Even after his retirement from this post he led an active life, and he published altogether more than 200 scientific studies. Some of them dealt with the pharmacology of digitalis and allied drugs.

The following well-known foreign medical men have died: Dr. RALPH AUGUSTUS MCDONNELL, formerly clinical professor of dermatology, Yale University School of Medicine; Dr. AXEL E. BISGAARD, a Copenhagen psychiatrist, aged 64; Dr. HENRI BLANC, former president of the Société des Chirurgiens de Paris; Dr. HANS SAUER, one of the pioneers of Kimberley, the Rand, and Rhodesia, and one of the first medical officers of health in South Africa, and author of an autobiographical work entitled *Ex Africa*; and Dr. FÉLIX LEGUEU, emeritus professor of urology in the Paris faculty, aged 72.

Medical Notes in Parliament

This week the House of Commons completed its consideration of the Prices of Goods Bill. It also discussed a proposal to increase old age pensions, the problems of civil evacuation, and the effect of certain Defence Regulations on the liberty of the subject.

The Parliamentary Medical Committee met on October 26. Sir Francis Fremantle reported on consultations with Ministers about medical questions in the emergency.

Sir Ernest Graham-Little has invited members representing university constituencies to form a committee.

Emergency Medical Service

Sir ERNEST GRAHAM-LITTLE inquired on October 25 what schemes of emergency medical service for the members of visiting staffs of voluntary hospitals in London were now official and open for acceptance by those members; and whether Dr. Elliot would take measures to encourage the return of visiting staffs to London, and the opening of the beds in hospitals for civilian cases, with a view to restoring some adequate instruction for medical students for whose education the London teaching hospitals were chiefly responsible. Dr. ELLIOT, in reply, stated that after the enrolment of whole-time officers in the Emergency Medical Service two modifications were introduced—one enabling these officers to go on indefinite leave without pay until the occurrence of casualties made it necessary to recall them to duty, and the other, which was recommended by a committee of representative consultants, enabling these officers to transfer from whole-time to part-time service. The second offer was made by letter to individual whole-time officers in the Emergency Medical Service, and officers proposing to accept the offer were asked to do so within a week. He was, however, willing for the present to continue to keep the offer open to those officers who had not yet replied. He was also in consultation with the Presidents of the Royal Colleges of Physicians, of Surgeons, and of Obstetricians and Gynaecologists, and others on a number of points arising out of experience of war conditions so far. He understood that he might receive shortly further proposals from a representative committee of the profession now sitting, which he would consider in connexion with the points raised by Sir Ernest. Dr. Elliot added that he would have no objection to a further arrangement under which certain senior men of the standing of Fellows of the Royal College of Physicians not already in the Service who were willing to give a substantial proportion of their time if a major emergency arose but were desirous, in present circumstances, of remaining without obligation and without remuneration, would so inform him. It had been made clear to hospitals by broadcast announcements and otherwise that civilians requiring in-patient treatment should be admitted. He had at all times been anxious, in consultation with the profession, to adopt such measures for making the necessary medical staff available as were consistent with due provision for the treatment of air raid casualties.

Mr. SPENS asked Dr. Elliot on October 26 to what extent he found it possible to consult the medical profession in determining the terms and conditions of employment of medical practitioners in the Emergency Medical Service. Dr. ELLIOT replied that consultations with representatives of the medical profession had taken place at frequent intervals. In 1937 the Central Emergency Committee of the British Medical Association was asked to compile a register of practitioners with a view to ascertaining their availability and special qualifications for service in an emergency. This register comprised about 98 per cent. of the profession. The utmost use was made of this committee (now called the Central Medical War Committee), working through local committees which were representative of the profession as a whole. The grading and basis of organization of the Emergency Medical Service followed the recommendations of the Central Medical War Committee and the Group Officers, who were eminent consultants. In July, 1939, invitations to enrol for whole-time service were sent to practitioners who were nominated by the Group Officers. Arrangements were subsequently made under which these full-time officers could go on indefinite leave without pay, subject to recall when occasion arose. Later, the option to transfer from full-time to part-time service was given under conditions recommended by a committee constituted from among leaders of the profession and presided over by Sir Bernard Docker. The constitution of this committee and the conditions it recommended were given in reply to Sir Ralph Glyn on October 12. On October 18 a committee consisting of the Presidents of the Royal Colleges of Physicians, of Surgeons, and of Obstetricians and Gynaecologists, and representatives of the Group Officers, of the Central Medical War Committee, and of the London County Council was set up to consider whether present circumstances necessitated further measures of reorganization. This committee had not yet reported.

Dr. Elliot circulated details of the personnel of the Central Emergency Committee (Central Medical War Committee), the Group Officers, and the special committee appointed on October 18, and these are published in the *Supplement* this week at page 216.

On October 31 Mr. GROVES asked the Minister of Health if he was aware that many medical men appointed to the emergency medical services had been dismissed, and that those in Class G would receive, by way of compensation for such dismissal, a payment equal to salary at the rate of £350; and if he would state by whom such appointments were made. Dr. ELLIOT said that no medical men appointed to the Emergency Medical Service controlled by him had been dismissed, and no question of compensation therefore arose. Class G consisted of resident house officers who were appointed for three months or longer at £350 a year, this being the scale of salary recommended by the Central Medical War Committee on behalf of the profession.

Heavy Vehicles as Ambulances

On October 31 Mr. WOODBURN asked the Minister of Health whether he was aware of the apprehension in the medical profession about the present practice of adapting heavy motor vehicles as ambulances for the conveyance of war-time casualties; that a number of medical officers of health and air raid precautions authorities had condemned these vehicles as unsuitable for the purpose intended; that the cost of compensation and the cost of adaptation of these heavy vehicles was greater than the capital cost involved in the purchase of new trailer ambulances; and whether he would give instructions to permit trailer ambulances to supplant unsuitable motor vehicles and relieve these for the needs of road transport. Miss HORSBRUGH said she was aware that some of the vehicles on which local authorities had had to rely for ambulances at the outset of the emergency required to be replaced by more suitable vehicles. It was desirable, on grounds of economy, to eliminate so far as possible the cost of hiring commercial vehicles for the ambulance service, and the Minister had recently authorized local authorities to purchase vehicles, but not necessarily trailers, in substitution for hired vehicles.

Panel Doctor's Payments

On October 24 Mr. GROVES asked the Minister of Health when and why the departmental circular was sent to insurance committees suggesting that only two-thirds of the sums due to insurance practitioners for last quarter should be distributed. Dr. ELLIOT replied that the circular was sent out on September 13. At the outbreak of war the departure of insurance practitioners on war service was in some cases not notified by them to insurance committees for a considerable time. The circular therefore recommended that where the position was not clear insurance committees should make payments on account representing the first two months only of the quarter, the balance being paid at the end of the present quarter or at such earlier date as might be convenient.

Recruitment of Doctors

Mr. GROVES asserted on October 25 that there was a feeling among members of the medical profession of victimization in connexion with the selection of personnel for the examination of recruits. He asked Mr. Ernest Brown whether he would collaborate with all associations of doctors to ensure equity. Mr. ERNEST BROWN replied that he was not aware of any ground for the alleged feeling of dissatisfaction among members of the profession.

Mr. GROVES inquired on October 26 whether Dr. Elliot had approached the Union of Medical Practitioners in respect of the supply of medical men for the forces and for the examination of recruits; and whether he would accept the services of this organization, which was available for co-operation with the Government. Dr. ELLIOTT said in reply that the register of medical men available for the duties indicated was kept by the Central Medical War Committee, which, with its local committees, was widely representative of the profession. While, therefore, he appreciated the desire of the Union to co-operate, he could not usefully avail himself of its services for the two purposes suggested.

Answering supplementary questions by Mr. Groves, Dr. ELLIOT said he had always done his best to co-operate with the trade union movement, but this was a case of different organizations, and there was difficulty in negotiating with both. The Central Medical Register collected the names of 98 per cent. of the profession, and in any organization that would be regarded as a good register.

Measles: Precautionary Measures in Reception Areas

Mr. ISAACS asked the Minister of Health on October 25 whether any steps had been taken in the reception areas to deal with the anticipated measles epidemic which, over some period past, has occurred regularly every two years. Dr. ELLIOT replied that he had drawn the attention of local authorities to the need for additional hospital accommodation in reception areas for cases of infectious diseases both notifiable and non-notifiable. He was also issuing regulations providing for the compulsory notification of measles and instructing medical officers of health to make such inquiries and take such steps as were necessary or desirable for investigating the source of infection, for preventing the spread of infection, and for removing conditions favourable to infection.

Effect of Aircraft Engine Noise

Sir FRANCIS FREMANTLE asked on October 25 what action Sir Kingsley Wood had taken to reduce deafness from engine noise in the aviators and mechanics of his Department, and to ascertain and train the deafened for further service; and whether he would obtain the co-operation of the National Institute for the Deaf in the matter. Sir KINGSLEY WOOD replied that devices to lessen the effect of aircraft noise were provided for all flying personnel. Research into the question continued. Nerve deafness due to engine noise affected the hearing to a minor degree only and, as cases were detected at an early stage, did not ordinarily result in incapacitation. All flying personnel were examined periodically to assess the condition of their special sense organs, including the ears.

Doctors at First-aid Posts

Mr. GROVES asked if Dr. Elliot knew of the growing discontent of doctors in relation to the unsatisfactory arrangements made in connexion with first-aid posts by reason of their frequent attendance for the purpose of ensuring efficiency should an emergency arise, and of the fact that they did not know whether they were to be remunerated or were expected to do such work voluntarily. Dr. ELLIOT on October 25 replied that he recently discussed with representative doctors attached to first-aid posts the arrangements already made for training the personnel attached to the posts and the remuneration to which they were entitled under those arrangements. He recognized that some revision of the plan might be required owing to the course which the war had taken up to the present. He was considering the representations made in the light of reports which he had asked his officers to make on the situation in various parts of the country.

Mr. WOODBURN asked on October 26 why doctors attached to first-aid posts were not supplied with service gas-masks, steel helmets, and protective clothing; and if Dr. Elliot would have this deficiency remedied forthwith. Dr. ELLIOT said arrangements had been made to supply doctors attached to all first-aid posts with civilian duty respirators. An issue of light protective clothing had been made to every post. As regards steel helmets, arrangements had been made to supply them to doctors attached to mobile first-aid posts. Those arrangements were being extended to other first-aid posts. It was not considered necessary to supply general service respirators for this type of work. In a further question Mr. Woodburn challenged Dr. Elliot's statement that there was an issue of proper protective clothing to all posts, and said that many doctors had been sent civilian gas-masks.

Evacuated Children: Small-pox and Diphtheria Prophylaxis

Sir GIFFORD FOX asked whether householders on whom evacuated children were billeted and who themselves had children were compelled to accept evacuees who had not been

inoculated against small-pox. Dr. ELLIOT said in reply on October 25 that the consideration whether a child had or had not been vaccinated was not at present one which the local authority was required to consider in arranging billets for evacuated children. In present circumstances the risk involved need not be taken into account.

Mr. VIANT asked on October 26 if Dr. Elliot's attention had been directed to a statement made by the medical officer of health to the Launceston Town Council that he had been advised by the Minister of Health that the consent of the teacher in charge of evacuated children to his proposal to inoculate them against diphtheria would be sufficient. Dr. ELLIOT said his attention had not been drawn to this statement, and he could not understand how it could have been made. It would be quite contrary to the policy and instructions of his Department for evacuated children to be immunized against diphtheria without the previous consent of their parents.

Local Authorities and Treatment of War Casualties.—Dr. ELLIOT announced on October 19 that he had informed local authorities and other similar bodies that the reasonable cost of treating and maintaining casualties in hospitals and generally any additional expenditure due to the participation of hospital authorities in the Emergency Hospital Scheme would be met by the Exchequer. He had forwarded to the representative associations of the local authorities concerned certain proposals as a basis upon which interim payments from the Exchequer should be made. He hoped to announce the arrangements at an early date.

Vaccination and Inoculation in the Army.—On October 24 Mr. HORE-BELISHA told Mr. Leach that definite instructions had been issued to all army commands to the effect that inoculation and vaccination were on a purely voluntary basis.

Sir VICTOR WARRENDER stated on October 19 that soldiers were required to rest for forty-eight hours after anti-typhoid inoculation. Only exceptionally had this period of rest to be extended. Sick leave was unnecessary. Untoward effects were unusual and, if they occurred, were transient.

Unsuitable Children's Camps in Suffolk.—Mr. SORENSEN drew attention on October 26 to complaints concerning cold, lack of light, inadequate air raid precautions, and general unsuitability of conditions affecting defective children evacuated from Leyton and elsewhere to Suffolk coast camps. Mr. KENNETH LINDSAY replied that the camps in question were inspected early in the summer by representatives of the evacuation authority for London, and appeared to be the most suitable accommodation which could be found for handicapped children. After expert inspection a number of these camps had not been found suitable for continued use by such children in winter conditions, and five had been vacated. It would probably be necessary to vacate two further camps.

Alien Medical Graduations at Edinburgh.—Sir JOHN ANDERSON announced on October 26 that he would have inquiries made and collect particulars of the cases of the sixteen graduates of foreign universities who had recently been admitted licentiates of the Royal College of Physicians of Edinburgh. He had not obtained information to show whether it was intended to allow them to practise medicine or surgery in Great Britain or in other parts of the British Empire.

Death Rates.—Mr. COLVILLE, replying to Mr. R. Gibson on October 31, said that except in the case of the largest towns, wide variations in the weekly death rates of individual towns were a normal experience. If the death rates in Greenock and Hamilton were examined over the first six months of this year it would be found that, although there were marked differences in the weekly rates between the one town and the other, the aggregate death rates over that period for each town and for the large burghs of Scotland as a whole were practically the same.

Cheap Milk Scheme.—Seventy-eight welfare authorities have submitted proposals for the supply of cheap milk for mothers and young children, 122 have stated that the matter is under consideration, 171 have not yet replied, and thirty-six have deferred consideration.

Notes in Brief

The distribution of anti-gas protective devices for young children is under review. Where additional quantities are required to meet the needs of evacuated children who have returned home these will be supplied.

Mr. CHAMBERLAIN hopes next week to be able to make a statement with regard to the further consideration of the Criminal Justice Bill in the House of Commons.

The standard margarine will contain additions of vitamins A and D, estimated to bring it up to the vitamin value of butter.

Allocation of raw materials for the glucose industry is under consideration, and the Government is aware of the demand for pure glucose for medicinal purposes and for the manufacture of infant foods.

Medical News

The Delhi correspondent of the *Times* states that H.H. the Maharaja of Gondal has sent the Viceroy of India a cheque for 100,000 rupees (£7,500), requesting that this sum be distributed among the dependants of the men who lost their lives through the sinking of the *Royal Oak*. The Maharaja is an M.D. and F.R.C.P. of Edinburgh, having graduated in medicine in 1892, and a Fellow of the College of Physicians and Surgeons of Bombay. He has received the high honours of G.C.S.I. and G.C.I.E. from the King-Emperor, and the LL.D. and D.C.L. from the Universities of Edinburgh and Oxford.

The B.B.C. announces that talks on health matters will be broadcast as follows: November 9, 4.15 p.m., "Talking it Over: Your Health," by a Harley Street physician; November 10, 9.45 a.m., and November 17, 10 a.m., "Family Life," by a medical psychologist.

By reason of the war it has been decided to shorten the course for the Cambridge Diploma in Medical Radiology and Electrology from nine to six months, and to hold examinations for Part I in December and April next, and Part II in April and July. Details will be found under "Universities and Colleges."

Owing to the war it has been decided by the council to suspend all activities of the Chelsea Clinical Society.

The King has approved the award of a silver clasp inscribed "Antarctic 1935–37" to Surgeon Commander Edward William Bingham, R.N., a member of the British Graham Land Expedition, 1935–7.

Manchester Royal Infirmary received permission on October 30 from the Ministry of Health to reopen the twenty-eight beds at the central branch in Roby Street and the 134 beds at Barnes Convalescent Hospital, Cheadle, where a new operating theatre has been installed.

At a recent meeting of representatives of the Leeds City Council, the West Riding Council, and the hospitals of Leeds, held at the General Infirmary, it was decided to increase substantially the number of beds available for civilian sick in some of the hospitals of the Leeds group. The Health Committee of the Leeds Corporation had previously decided to release for civilian sick about a hundred beds out of the eight or nine hundred for war casualties.

National Rat Week begins this year on November 6. A leaflet "The Destruction of Rats and Mice" is issued free on application to the Ministry of Agriculture.

A cable has recently been received in London from Monte Video quoting a declaration by the Medical Syndicate of Uruguay, which states that in view of the events taking place in Europe the Syndicate wishes once more to record its repudiation of wars of conquest, and expresses its spiritual solidarity with the democratic countries which resist the use of force as a means of subjugating weaker nations.

The issue of the *Schweizerische Medizinische Wochenschrift* for October 7 is devoted to experiments on living animals, and contains articles by such well-known authorities as A. von Muralt and H. Hediger of Berne, W. R. Hess, Hans Fischer, H. Mooser, W. Free, and H. Binswangen of Zurich, Etienne Burnet of Tunis, R. Dujarric de la Rivière of Paris, Paul Uhlenhuth of Freiburg i. B., H. Roch of Geneva, Rudolf Staehelin of Basle, followed by an account of the anti-vivisection movement in England.

According to *Minerva Medica* of September 1, the only female surgeon in Germany is Frl. Caterina Freyberg of the Olga Hospital of Düsseldorf. She was the first medical student in Germany, and carried out her studies at Bonn. During the last war she directed a field hospital at Charleroi and a military hospital at Lenz. Since then other German women have qualified in medicine, but she remains the only surgeon.

According to *Policlinico* (Sez. Prat.), October 16, every soldier in Germany has his blood group noted in his identification book.

The issue of *Paris Médical* for October 7–14, which is devoted to neurology, contains articles by A. Baudoin and H. Schaeffer on neurology in 1939, the diagnosis of infantile paralysis by L. Babonneix, and the retrogression of infantile encephalitis by A. Tournay; and an obituary notice of Professor Marcel Labbé.

Professor H. C. Souja-Aranjo, member of the Brazilian Academy of Medicine and vice-president of the International Leprosy Commission, has founded two prizes at the Academy, each of the value of 2,000 dollars—namely, the Kadrowsky prize for the best work on the bacteriology of leprosy, and the Lieras Acosta prize for the best work on the immunology of leprosy.

A revised list (No. 7) has been issued by the Ministry of Health of treatment centres approved by the Minister under the Public Health (Venereal Diseases) Regulations, 1916, with particulars as to the days and hours for medical examination and treatment, and for intermediate treatment by or under the supervision of nurses or male attendants. A list of hostels and other institutions for women which accept in-patients under the approved schemes of local authorities for the treatment of venereal diseases is appended to the document.

Sir William Bragg, President of the Royal Society, has issued an appeal for funds for the Anglo-French Ambulance Corps, of whose general committee he is chairman. The personnel of the ambulance would be recruited from British residents in France. The honorary secretary's address is 42, Ennismore Gardens, London, S.W.7.

Dr. Robert Doerr, professor of hygiene at the Basle faculty of medicine, has been made a doctor *honoris causa* in natural science in his university in recognition of his work on ultra-virus diseases, especially psittacosis, and the relations between herpetic virus and encephalitis.

According to *Policlinico*, the mortality in the large cities of Germany from senile diseases such as cancer, diabetes, apoplexy, heart disease, and senile decay has recently shown an increase. As regards the infectious diseases of children, there has been a considerable increase in the first quarter of 1939 in the mortality of measles, scarlet fever, and whooping-cough, while that of diphtheria has fallen.

The following Italian professors have retired on reaching the age limit: Roberto Alessandri of Rome (surgery), Filippo Botazzi of Naples (physiology), Arturo Donaggio of Bologna (nervous and mental diseases), Ersilio Ferroni of Florence (obstetrics), and Ferdinand Levine of Milan (human anatomy).

Sofia University, which celebrates its fiftieth anniversary this year, has had a faculty of medicine only since 1918. At present there are 2,900 medical practitioners in Bulgaria, the ratio to the population being 1:2,000, compared with 1:5,090 in 1924. There is a plethora of doctors in the larger cities, while in the villages there is a scarcity.

The Dutch Medical Association has issued a request that all doctors in Holland should make the smallest use possible of motor fuel, and should use their motor cars only for their practice.

It has been decided that during the war no civilian doctor in Germany may change his residence without the permission of the Medical Board.

Since 1937 the following eminent Viennese doctors have been commemorated on postage stamps: Gerhard van Swieten (1700–1772), Leopold von Auenbrugger (1772–1809), Karl von Rokitansky (1804–1878), Joseph Skoda (1805–1887), Ferdinand von Hebra (1816–1887), Joseph Hyrtl (1810–1894), Theodor Billroth (1829–1894), and Theodor Meynert (1833–1892).

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales scarlet fever and pneumonia (influenzal and primary) have risen during the week by some 14 per cent. and 48 per cent. respectively. There is no reason to suppose that the observed increases are more than should be expected on the approach of winter; actually, notifications for Great Britain and Eire, with the exception of Northern Ireland, are below the figures for last year. Pneumonia, on the other hand, is rather more prevalent than last year; in view of the lower incidence of primary pneumonia in Scotland and the smaller number of deaths from this disease in England and Wales, it is probable that influenza or febrile catarrhs complicated by bronchopneumonia are mainly responsible. Clinical reports suggest that colds and catarrhs rather than influenza are the prevalent infections at present.

Compared with last year, notifications of diphtheria have slumped considerably in all the countries except Northern Ireland. In London, as in other large cities, epidemic diseases, especially those in which attack falls principally on children, represent only a fraction of last year's levels. Enteric fever, which attacks adolescents and adults chiefly, shows a slight increase over last week and a decided increase over last year. Four counties accounted for more than half the total for England and Wales—namely, Chester, 10 (Birkenhead 5, Wallasey 2, Bebington urban, Stockport, and Wilmslow urban 1 each); Suffolk, East, 5 (Lowestoft 1, Deben rural 4); Yorks, West Riding, 4 (Rothwell urban 2, Harrogate and Leeds 1 each); Middlesex 3, all in Harrow.

Scarlet Fever in 1939

In the last decade there has been a decline in the incidence of scarlet fever in England and Wales, Holland, France, and Hungary since 1934, in the United States of America since 1935, and in Ireland, Finland, Germany, and Rumania since 1936. In the first six months of 1939 a decline compared with 1938 has been observed in England and Wales, Belgium, Holland, Switzerland, Poland, and Yugoslavia, but increases have been reported in Sweden, Germany, Rumania, and Bulgaria. In the United States scarlet fever was lower during the four weeks ended August 12, 1939, than the median level for the thirteen-year period 1926–38.

Measles in U.S.A.

The year 1938 witnessed the worst measles epidemic in recent times. The number of cases reported was more than two and a half times that of 1937 and twice the average of that of the preceding five years. Deaths from measles were three times that of 1936 and 1937. The epidemic was widespread over the whole continent with the exception of the New England and Pacific Coasts, which remained fairly free.

No. 41

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 14, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	23	—	5	2	—	18	4	2	—	—
Deaths		—	1				2	1		
Diphtheria	941	33	204	45	37	1,288	138	222	51	35
Deaths	20	—	5	1	1	27	5	5	2	—
Dysentery	33	4	89	1	—	49	13	14		—
Deaths			4	—	—			—	—	—
Encephalitis lethargica, acute	7	—	—		—	4	—	1		—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever	42	2	1	7	4	32	11	3	15	3
Deaths	3	—	—	—	—	3	1	1	—	—
Erysipelas			54	15	6			63	8	3
Deaths		—	—				1	2		
Infective enteritis or diarrhoea under 2 years										
Deaths	29	6	22	4	4	54	14	18	11	1
Measles			6		15		26	8		1
Deaths	2	—	—	—	—	—	—	—	—	—
Ophthalmia neonatorum	88	10	16		1	96	15	32		—
Deaths										
Pneumonia, influenzal*	519	46	10	2	2	483	38	3	1	7
Deaths (from influenza)	20	2	3	1	1	12	2	1	—	1
Pneumonia, primary			133	12				161	5	
Deaths		7		7	6		9		10	6
Polio-encephalitis, acute	—	—				8	1			
Deaths		—					—			
Poliomyelitis, acute	31	1	—	1	1	77	4	6	—	—
Deaths		—	—				1	—		
Puerperal fever	3	3	6	—	1	5	5	11	1	—
Deaths		1†					—			
Puerperal pyrexia	176	14	27		1	156	10	16		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,448	54	230	66	112	1,942	186	355	68	80
Deaths	—	—	—	—	—	1	—	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough			12		1		70	91		13‡
Deaths	2	—	1	—	—	3	—	—	—	—
Deaths (0-1 year)	258	27	65	19	17	282	43	66	32	10
Infant mortality rate (per 1,000 live births)						47	35			
Deaths (excluding stillbirths)	4,439	691	644	157	141	4,196	745	623	172	119
Annual death rate (per 1,000 persons living)			13.0	10.6	12.4	10.3	9.5	12.7	11.6	10.5
Live births	5,311	666	862	356	217	6,460	1,237	892	357	247
Annual rate per 1,000 persons living			17.4	23.9	19.1	15.9	15.8	18.2	24.2	21.9
Stillbirths	244	18	25			286	48			
Rate per 1,000 total births (including stillborn)			28			42	37			

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.
‡ All in Belfast.

Medico-Legal

INSANITY AND DESERTION

Mr. Justice Langton decided on October 11 in Rushbrook *v.* Rushbrook[1] that a petition for divorce based on desertion cannot succeed if the respondent has been certified insane during the three years immediately before it is filed. The Matrimonial Causes Act, 1937, makes desertion continuously for three years before the petition a ground for divorce, but in addition to separation the respondent must also have what is called the *animus deserendi*—the intention to desert. If the respondent loses volition even for a single day he loses this *animus* and the period of desertion is interrupted. Mrs. Rushbrook was described as a case of dementia praecox, but the husband brought evidence that she had been at all times able to exercise a rational judgment upon the question of her relations with her husband. He asked the court to infer that she had a continuing *animus deserendi*. The learned judge, however, pointed to the judgment of the Master of the Rolls in Williams *v.* Williams,[2] from which he understood that it is not possible to make any inferences at all concerning the intention of a certified lunatic. This woman was under certificate for at least one year of the period necessary for the success of the petition, and the presumption that she had then no *animus* could not be rebutted by medical or other evidence.

A LEGAL ANOMALY

What a confusing state of the law! If a certified patient on leave from a mental hospital is sued for assault, negligence, or trespass, the certificate is not a final answer to the allegation; his mental condition is a matter of fact to be established by evidence. If a patient under certificate in a mental hospital attacks another patient and kills him he is put on trial, and may be found by a jury fit to plead; the relevant fact is his actual mental condition, not the existence of the certificate. A lunatic under certificate can during a lucid interval make a valid will. Why should there, in the Divorce Court alone, be an irrebuttable presumption that he is irresponsible? Every psychiatrist knows that many patients under certificate are perfectly capable of forming or maintaining an intention with reference to their marriages. Even if this were not so it is unfair that when a spouse has been a wilful deserter for a substantial period his insanity should count, against the other spouse, as a change of mind. This position must cause unjust and unnecessary hardship in many cases.

NEGLIGENCE OF A DENTAL CORPORATION

In December, 1937,[3] a lady visited the premises of the Co-operative Dental Association, Ltd., of Balloon Street, Manchester, to have an aching tooth extracted. She was advised to have all her teeth removed, and this was done. The anaesthetist then advised the dentist to tell her friends that she should be taken home as soon as possible and given medical attention. She died from pulmonary tuberculosis, although at the time of the extraction no one had any idea that she was already tuberculous. Her death was not connected with the extraction. When the association claimed their fees from her husband he refused to pay, and alleged that the dentist had been negligent in proceeding to complete the extraction in view of the patient's symptoms. The association sued the husband in the county court, but the learned judge found that the dentist had been negligent, and that the negligence of the association had continued in providing dentures at a time when the patient's mouth had been quite unfit to receive them. He therefore gave judgment for the husband with costs.

[1] 1939 4 All E.R. 73.
[2] 1939 3 All E.R. 825; *British Medical Journal*, 1939, **2**, 590.
[3] *Manchester Guardian*, October 19.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Naval Service—Lump-sum Gratuity

"S. P." is serving as a temporary surgeon lieutenant R.N., and is due to complete his five-year short service commission next February. If he then leaves the service the £1,000 gratuity payable will be untaxed. Will he have to pay tax thereon if he remains in the Service?

*** The decisions in the leading cases of lump-sum payments—Cowan *v.* Seymour and Hunter *v.* Dewhurst—lay stress on the fact that non-liability arose from the cessation of the employment. It would seem to follow that in the continuance of the employment there would not be grounds legally to remove the gratuity from the general liability that attaches to payments received for services rendered. At the same time it would clearly be inequitable for the Government to levy a tax otherwise not due because an officer had remained at his post in time of war. We suggest that our correspondent should communicate with the Admiralty Income Tax Assessor (or the Board of Inland Revenue at Somerset House), putting the facts before them and asking for their special consideration. We should be interested to learn the result. Failing other means, would it be possible to allow the present commission to lapse at the end of the five years, and rejoin a few days later?

LETTERS, NOTES, ETC.

Booklets on First Aid

The Boys' Brigade Ambulance Handbook and Manual of First Aid, by Dr. R. Leslie Ridge, and published by authority of the Brigade Executive, is a well-illustrated and compact volume of 199 pages (6d.). It deals with the usual matters included in first-aid books, and the use of thick type makes reference easy—an important point. The photographs illustrating the various types of bandage are particularly good. The clearly written section on fractured spine is accompanied by an *x*-ray picture of fracture of the cervical spine, but this particular fracture is not dealt with in the text, an omission which might be remedied in the next edition, as the mode of transport of such a case differs from that of a case of fracture of the lumbar vertebrae. The book is written in clear and unambiguous English, and should be of value to all concerned in the teaching of first aid. For those attending first-aid lectures Dr. E. S. Brawn has compiled his *Questions and Model Answers on First Aid* (George Gill and Sons; 6d.). Another help to the first-aider is *The Lecture Pocket Book* by Dr. Kenneth Black (George Gill and Sons; 1s.)—this consists of four useful coloured plates illustrating the anatomy of the body and of hints on treatment of haemorrhage and fractures.